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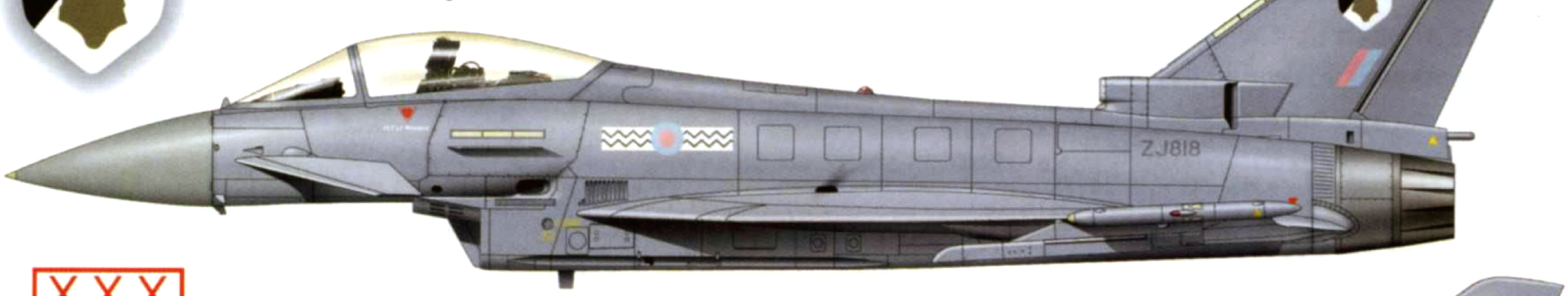
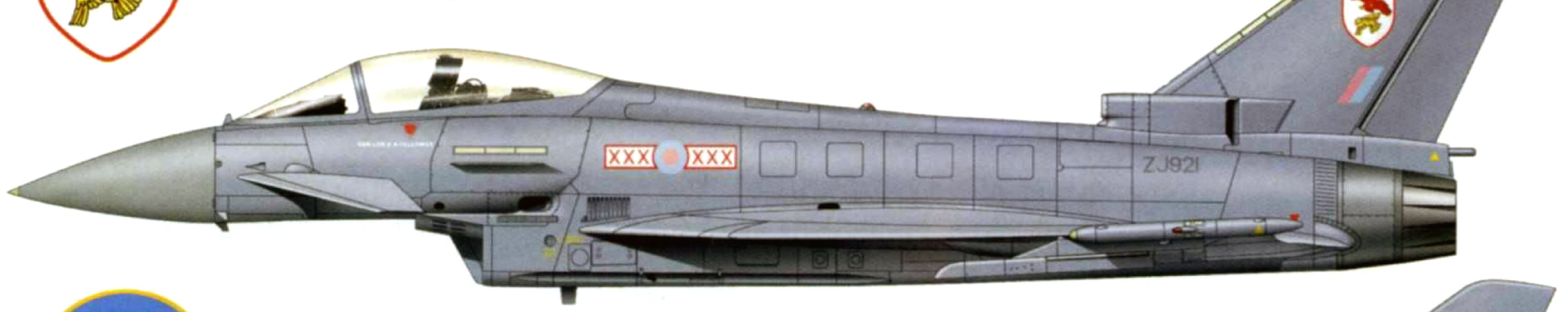
Eurofighter Tornado F Mk 2, ZJ818/AD, No.17 Squadron, Royal Air Force, 2006. Camouflage Grey overall with white codes on fin and pilot's name beneath cockpit; black/white markings flanking fuselage roundels. Roundels in pink and light blue on fuselage sides, above port and below starboard wings



Eurofighter Tornado F Mk 2, ZJ921/BW, No.29 Squadron, Royal Air Force, 2006. Camouflage Grey overall with white codes on fin and pilot's name beneath cockpit; red/white markings flanking fuselage roundels. Roundels in pink and light blue on fuselage sides, above port and below starboard wings

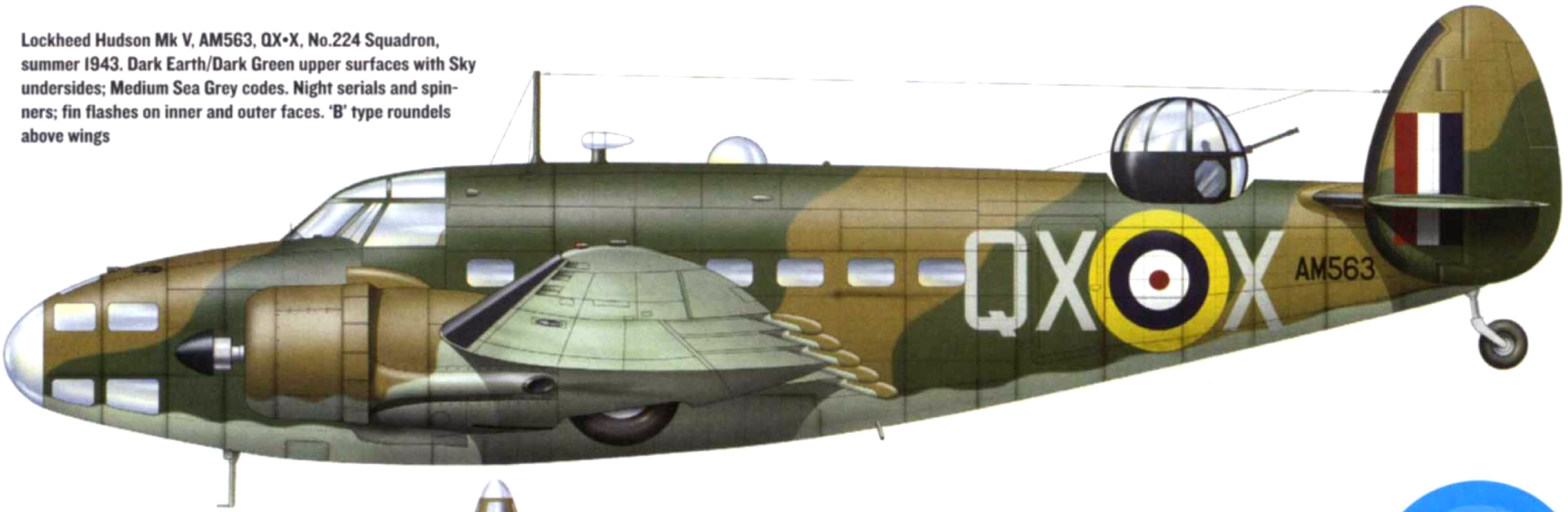


Eurofighter Typhoon, 30+19, JG.74, Luftwaffe, 2006. Grey FS.36375 overall with national markings on fuselage sides, above port and below starboard wings; codes in black, outlined in white

Eurofighter Typhoon MM.7278/4-12, 4° Stormo, Italian Air Force, 2006. Grey FS.36375 overall; roundels on fuselage sides and above port and below starboard wings. codes in light blue, thinly outlined in black. Italian flag on fin commemorates Italy's football World Championship title, July 2006

Eurofighter Typhoon, C.16-26/11-06, Ala 11, Spanish Air Force, Moròn Air Base, October 2005. Grey FS.36375 overall with national markings in six positions; all lettering and markings in black

Lockheed Hudson Mk V, AM563, QX•X, No.224 Squadron, summer 1943. Dark Earth/Dark Green upper surfaces with Sky undersides; Medium Sea Grey codes. Night serials and spinners; fin flashes on inner and outer faces. 'B' type roundels above wings



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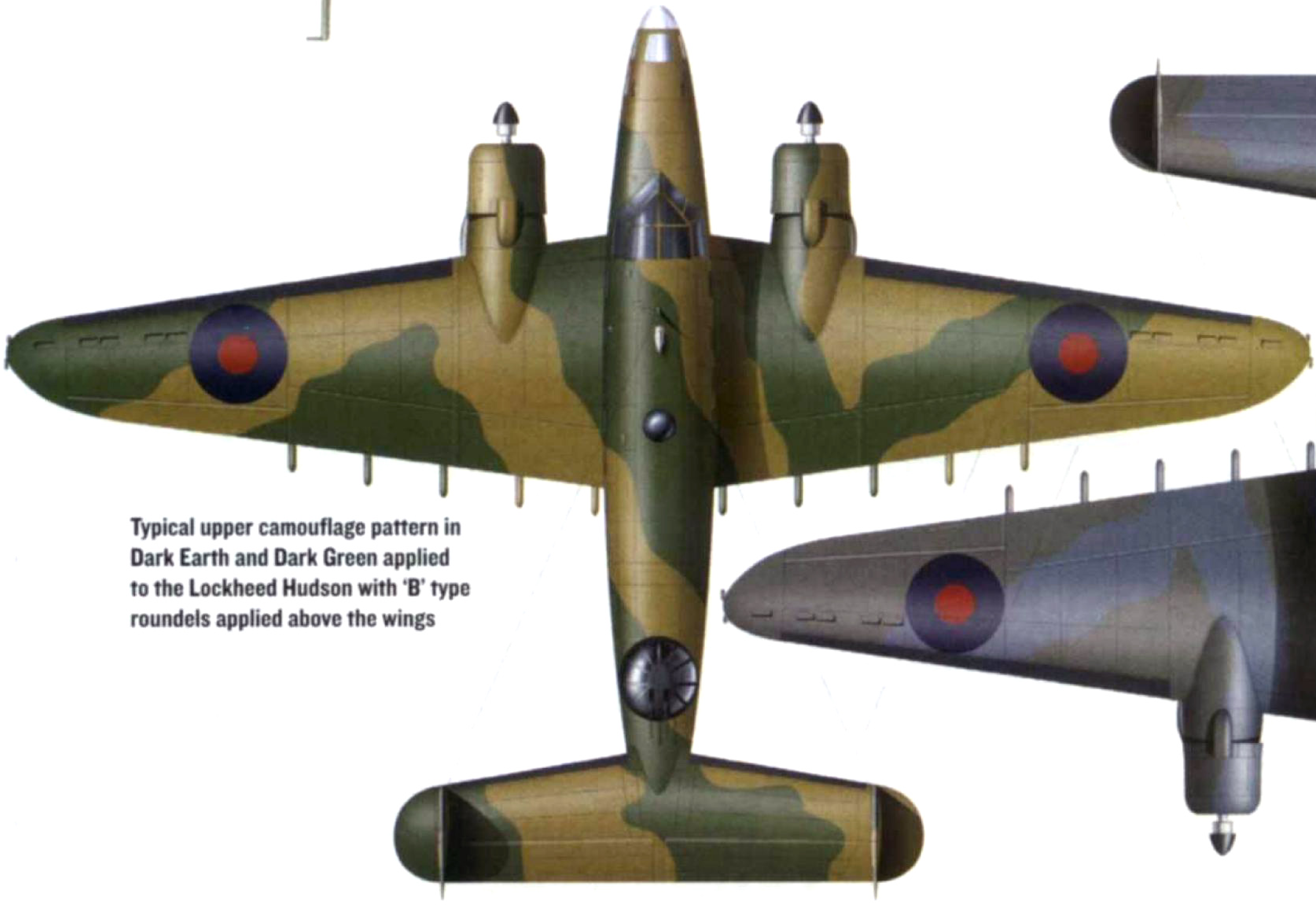
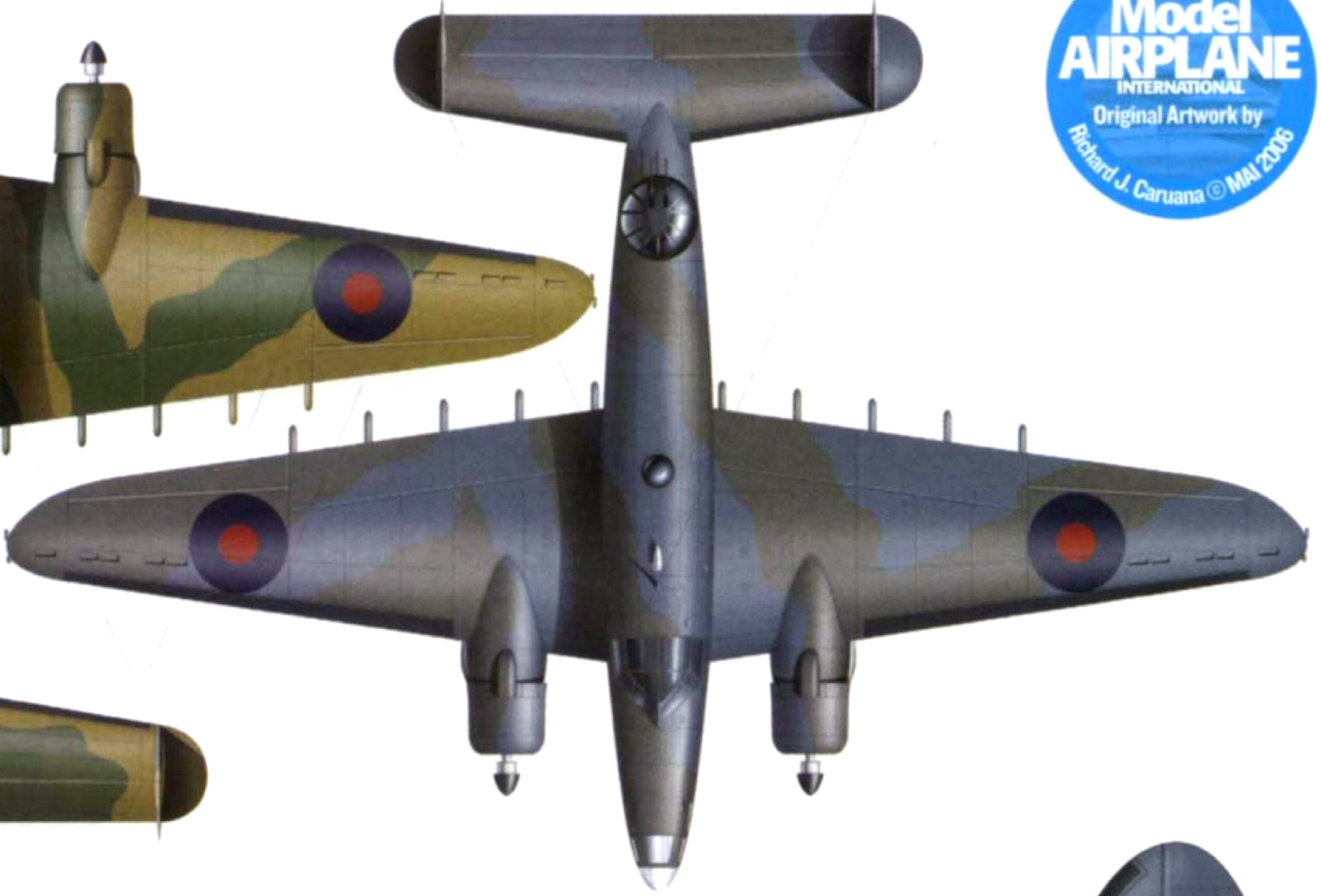
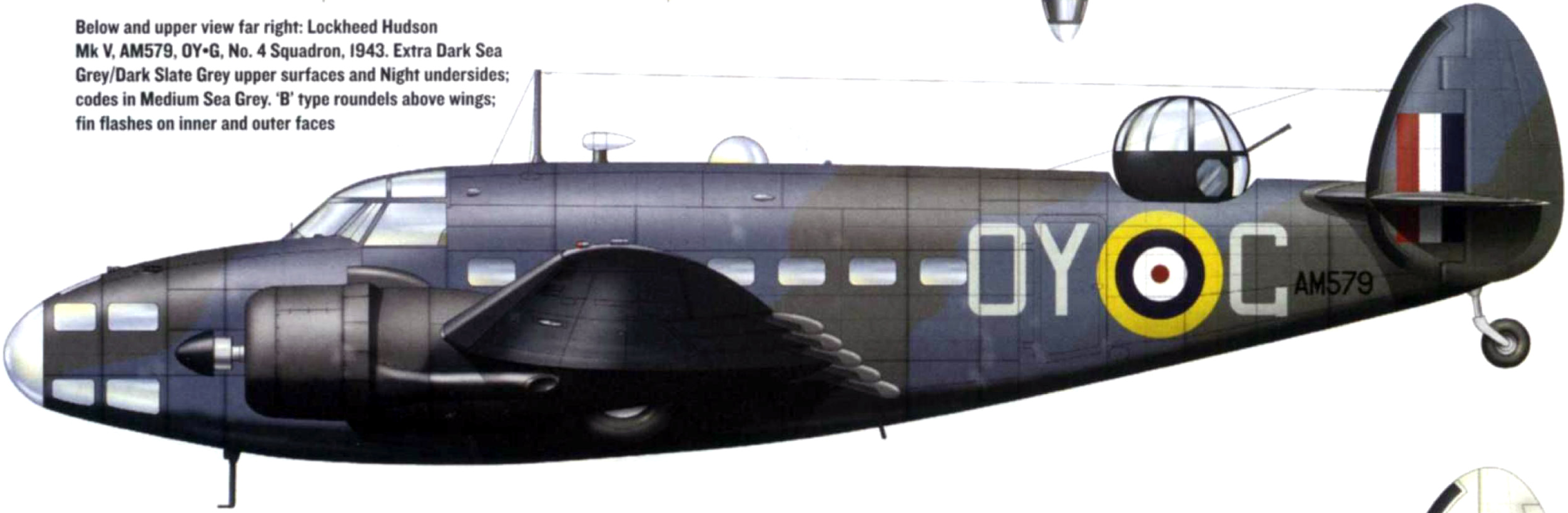


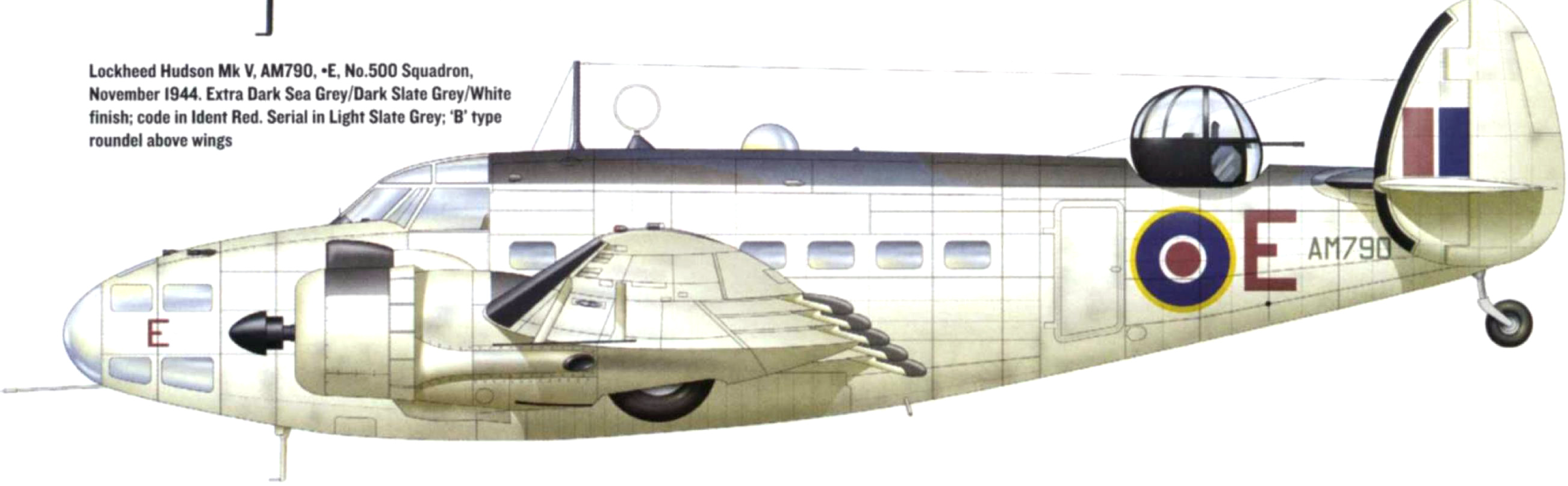
Typical upper camouflage pattern in Dark Earth and Dark Green applied to the Lockheed Hudson with 'B' type roundels applied above the wings



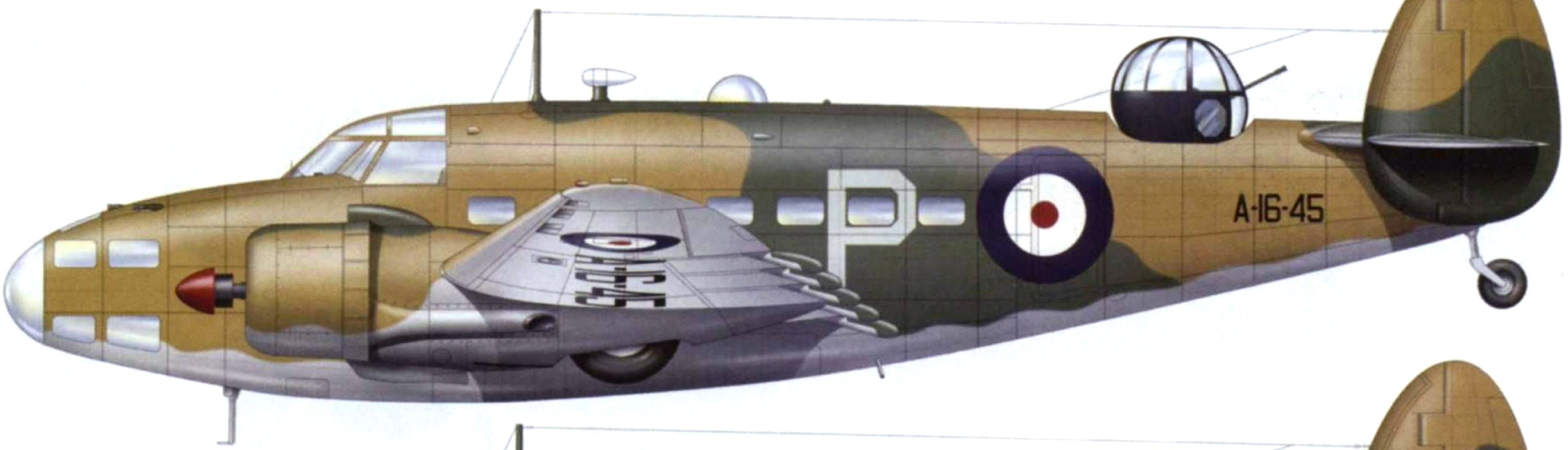
Below and upper view far right: Lockheed Hudson Mk V, AM579, OY•G, No. 4 Squadron, 1943. Extra Dark Sea Grey/Dark Slate Grey upper surfaces and Night undersides; codes in Medium Sea Grey. 'B' type roundels above wings; fin flashes on inner and outer faces

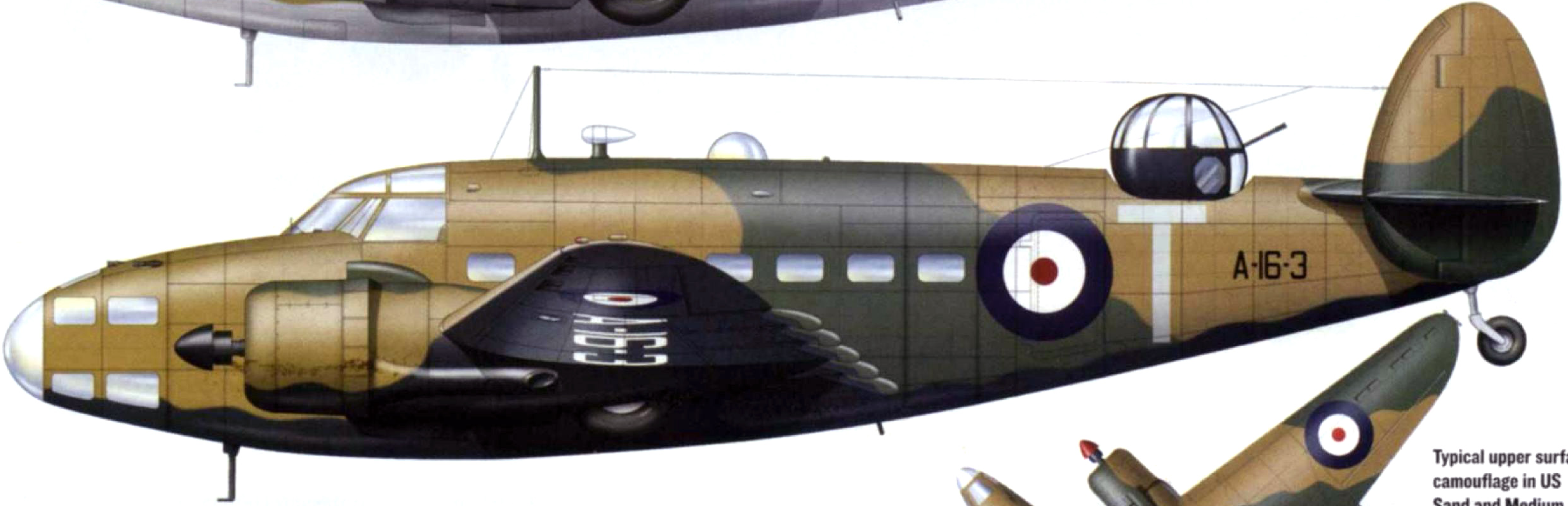


Lockheed Hudson Mk V, AM790, •E, No.500 Squadron, November 1944. Extra Dark Sea Grey/Dark Slate Grey/White finish; code in Ident Red. Serial in Light Slate Grey; 'B' type roundel above wings

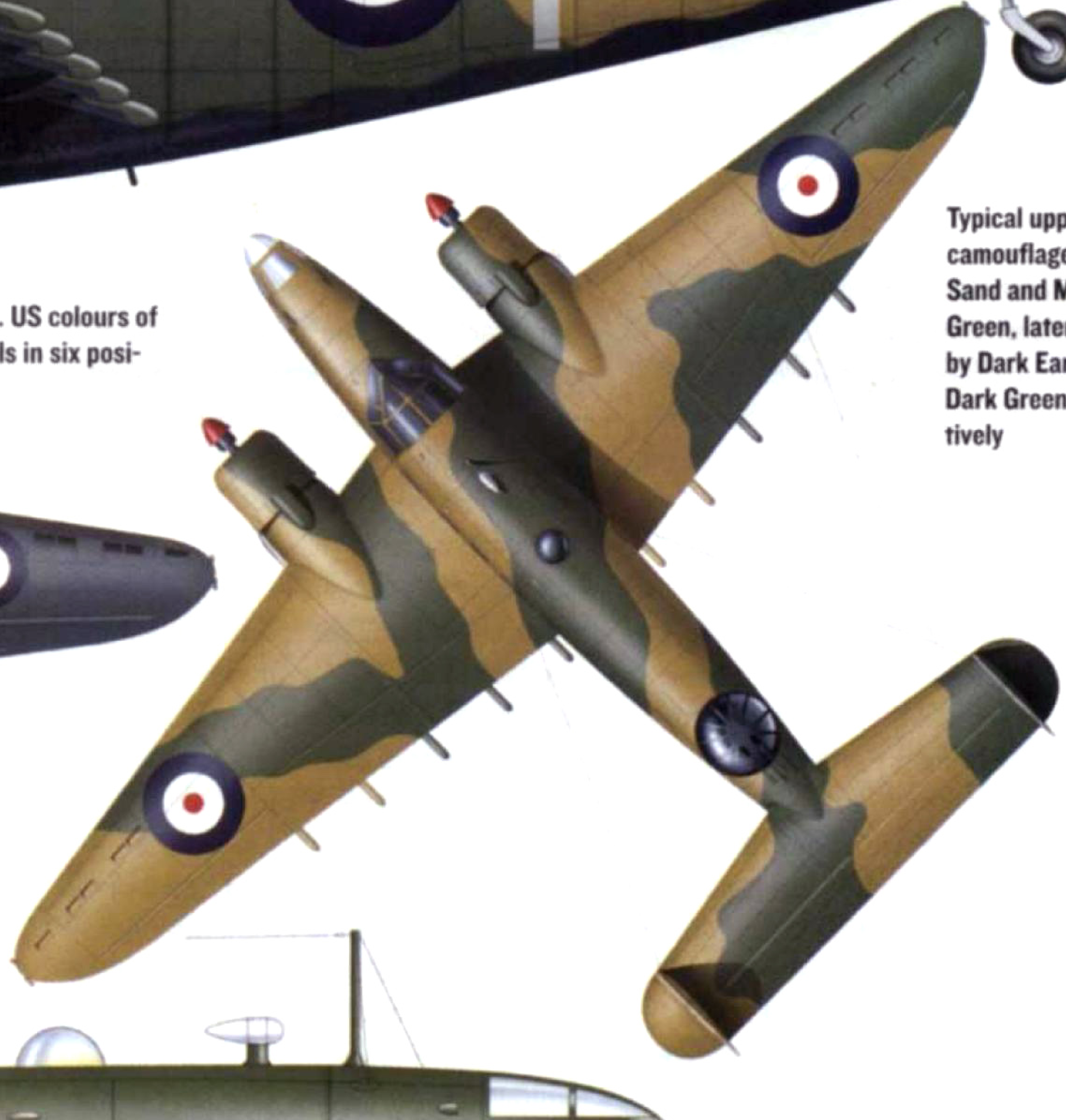


Lockheed Hudson Mk I (later redesignated Mk IV), A-16-45, No.14 Squadron, RAAF, Pearce, 1941. US colours of Sand and Medium Green uppersurfaces with Aluminium undersides; Medium Sea Grey codes, black serials. Type A roundels in six positions; red spinners



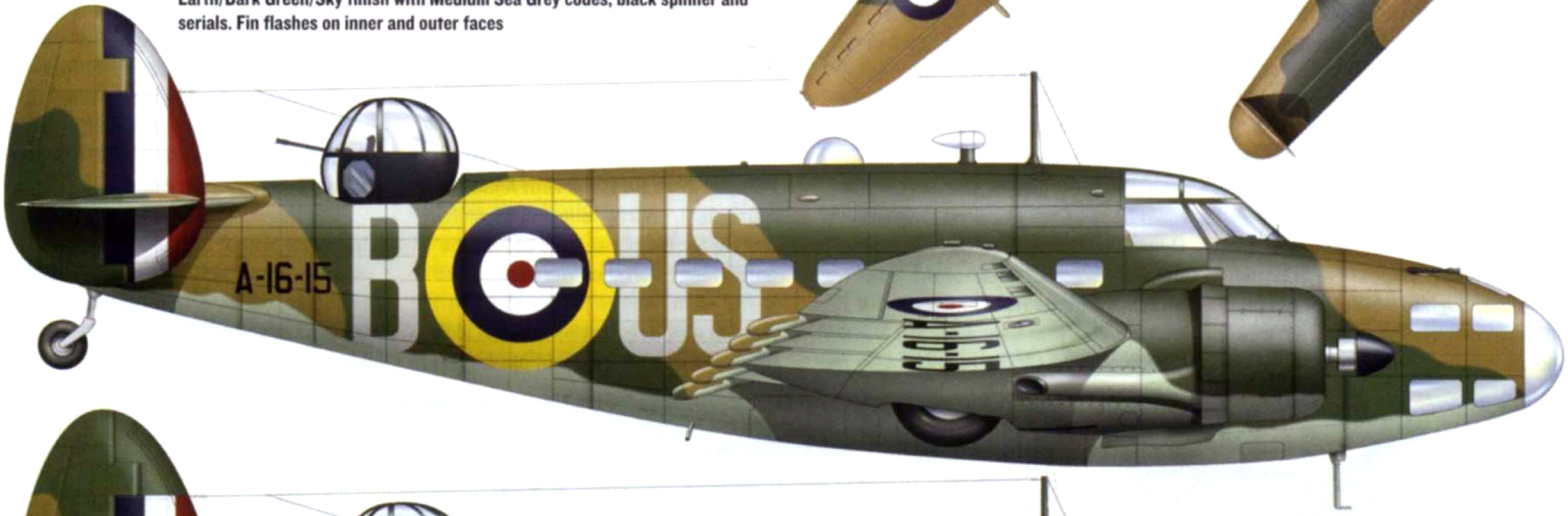


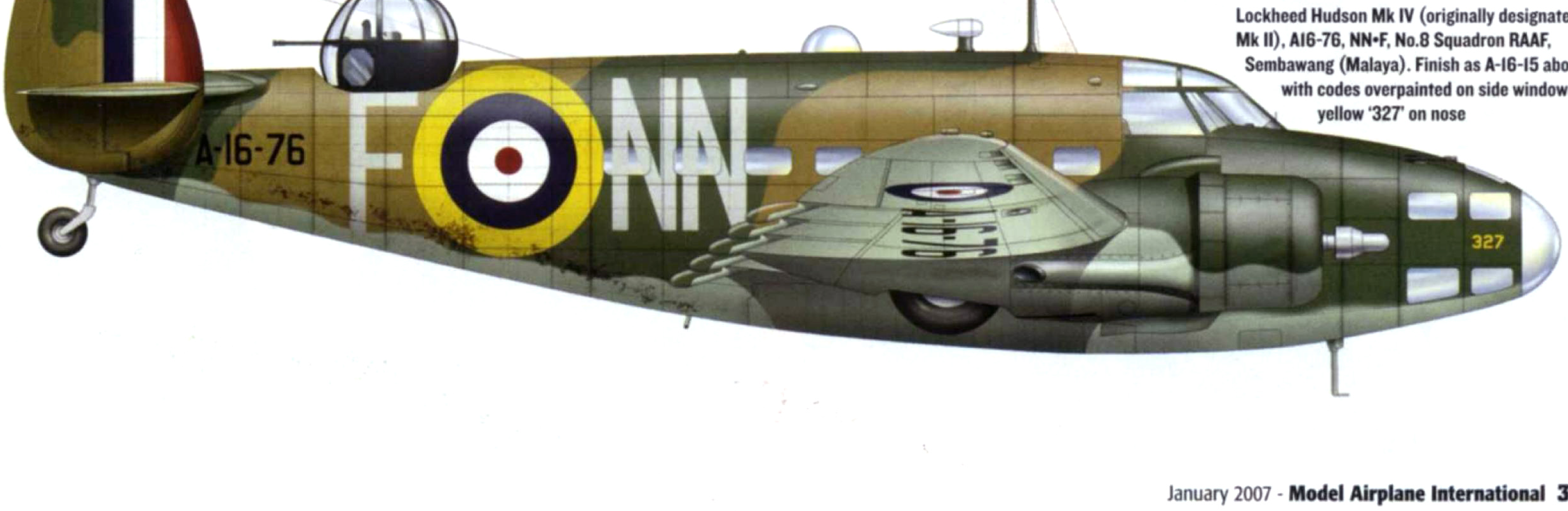
Above: Lockheed Hudson Mk I (later redesignated Mk IV), A-16-3, No.23 Squadron, RAAF, Archerfield, 1941. US colours of Sand and Medium Green uppersurfaces with Aluminium undersides; Medium Sea Grey code. Type A roundels in six positions; black serials on fuselage sides, repeated in white below wings (see below)



Typical upper surface camouflage in US Sand and Medium Green, later replaced by Dark Earth and Dark Green respectively

Lockheed Hudson Mk IV, A-16-15, US•B, No.21 Squadron RAAF, early 1941. Dark Earth/Dark Green/Sky finish with Medium Sea Grey codes; black spinner and serials. Fin flashes on inner and outer faces





Lockheed Hudson Mk IV (originally designated Mk II), A16-76, NN•F, No.8 Squadron RAAF, Sembawang (Malaya). Finish as A-16-15 above with codes overpainted on side windows; yellow '327' on nose

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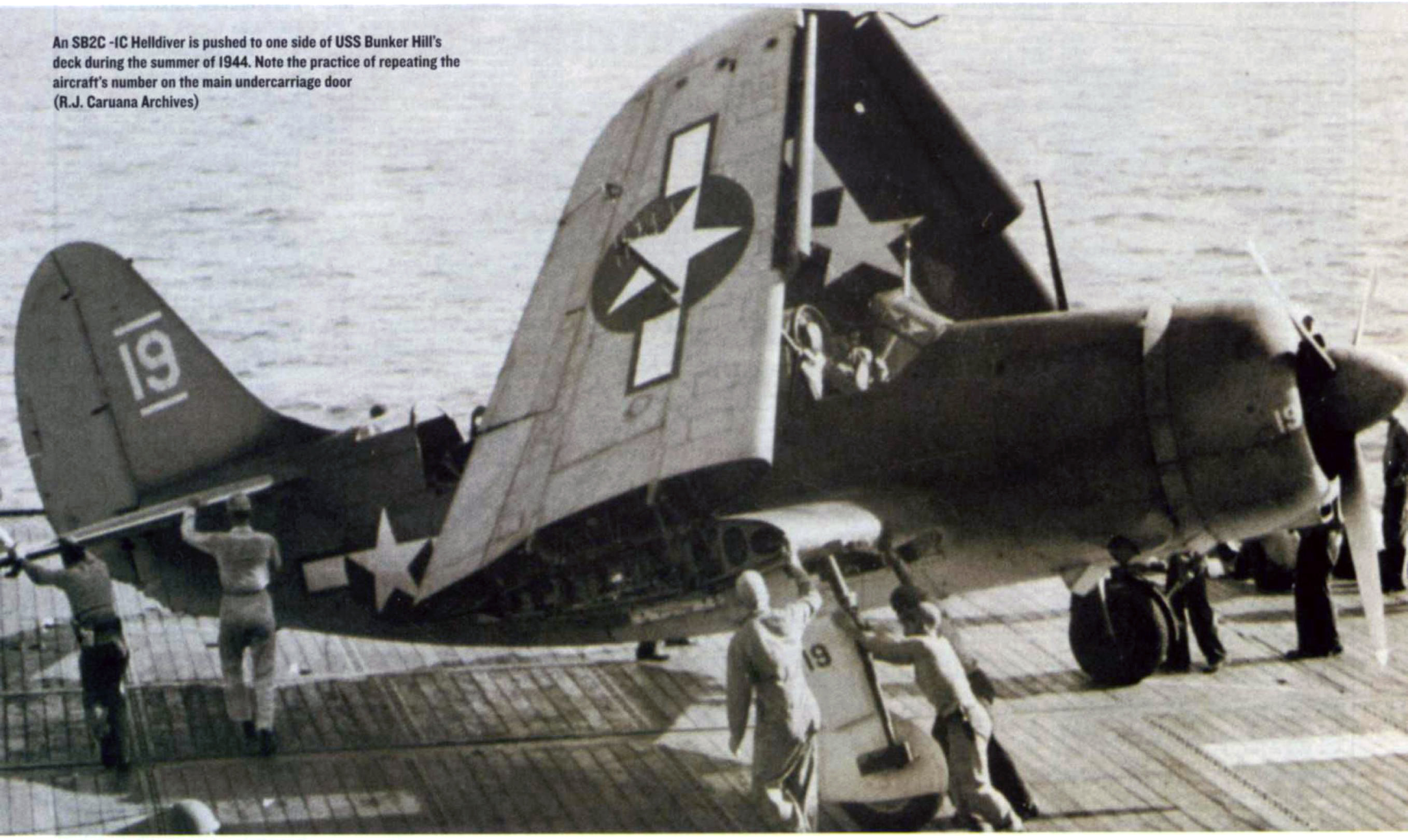


An SB2C -1C Helldiver is pushed to one side of USS Bunker Hill's deck during the summer of 1944. Note the practice of repeating the aircraft's number on the main undercarriage door (R.J. Caruana Archives)

THE BEAST FROM NEW YORK

The SB2C Helldiver's operational debut was quite disappointing and the greater part of the fault lied with officialdom's ever-increasing demands that eventually created nearly insurmountable problems for the design team.

Once the teething troubles had been ironed out though, it proved to be a strong aircraft, able to take enormous punishment in action.

At the time that the first SBD Dauntless were being accepted by the United States Navy (USN) an ambitious programme for a far superior dive-bomber was being launched. Range, armament and internal bomb load were double that of any dive-bomber then in service with the United States Navy (USN) while performance had to be bettered by 160km/h. Of the six companies that responded only two were considered, and early in 1938 Brewster offered the XSB2A-1 while Curtiss proposed the XSB2C-1.

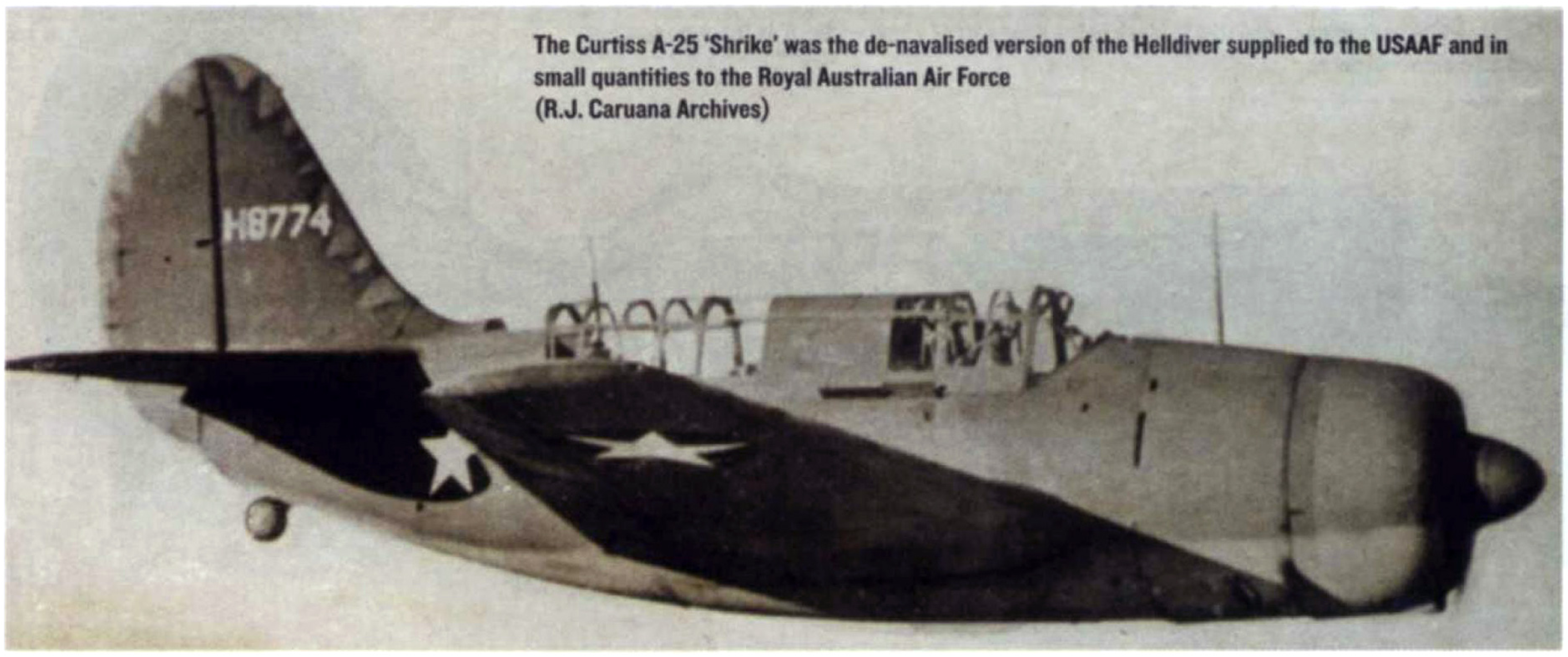
Design team head Raymond C. Blaylock adapted technology of the well-proven Model 77 SBC-4 biplane, of which Curtiss had already been planning a monoplane version the previous year. To ensure an easy gestation period the project was shorn of any innovations, and on this reasoning the USN awarded a contract for a prototype (XSB2C-5, BuNo.1758) in March 1939. Defensive armament proposals proved to be an initial hurdle and the final layout was not accepted before February of 1940. Meanwhile, Brewster's ZSXB2A-1 was also ordered into production, all 451 examples (SB2A Buccaneer) being eventually relegated to training and reconnaissance after having proved to be inferior to the Curtiss product.

DEVELOPMENT

Bearing company designation 'Model 84', the new aircraft bore great similarity in its fuselage layout to the older SBC-4 except for the Wright R-2600-8 Cyclone generating 1,700hp hooked up to the front. By July 1940, wind tunnel testing had indicated that wing maximum lift coefficient was below estimates and several alternatives were studied to delay stalling, including the installation of full-length leading edge slats, though finally a 10% increase in wing area was adopted with a consequential penalty in weight and, therefore, performance.

This setback was followed by a series of others creating further delays: redesign of the wing armament installation, delay in engine qualification and further structural changes of weak areas that came to light during static testing. Test pilot Lloyd Childs flew the prototype from Curtiss' New York plant for the first time on 18 December 1940, immediately encountering stability problems. On 9 February 1941, this machine was damaged when a forced landing was attempted after an engine cut; luckily the pilot survived. After an extensive rebuild the aircraft was back in the air on 6th May but four days later it ground looped after the left landing gear collapsed suffering minimal damage proving, to a certain extent, its robust construction.

By the end of October the aircraft was considered ready for service trials and on 12th November it was shipped to Port Colombus to initiate dive tests. All proceeded well until 12th December, when test pilot BT Hulse had to hastily depart from the aircraft after the starboard wing and tailplane broke away during a maximum 'G' dive from 22,000ft.



The Curtiss A-25 'Shrike' was the de-navalised version of the Helldiver supplied to the USAAF and in small quantities to the Royal Australian Air Force (R.J. Caruana Archives)

Meanwhile, an order for 370 examples of the SB2C-I had been negotiated with Curtiss-Wright in the summer of 1940, calling for the production of 85 aircraft per month starting from January 1942. Curtiss had to build a mass production line – an unprecedented event, as previous USN orders were practically hand-built due to their relatively small numbers. Only two months later, this order was increased to 578 examples. The surprise attack on the USN Fleet at Pearl Harbor on 7th December 1941 increased the emergency attached to the SB2C programme.

A sub-contracting programme was also undertaken to relieve pressure from Curtiss-Wright production facilities, especially as the USN announced in March 1942 its intention to purchase a further 3,000 examples! This contract was signed in June coinciding with the rollout of the first production aircraft (by that time named Helldiver), that flew on 30 June 1942. During August the second example joined the test programme, with changes being introduced wherever called for. Externally these were minimal, such as revision of the tailwheel support (eventually to be completely redesigned on later models). The Canadian Car & Foundry of Fort Williams, in Ontario (Canada) was contracted to produce 1,000 examples, of which 450 were allocated to the Royal Navy (RN).

INTO SERVICE

Just before the end of 1942 the first operationally equipped Helldivers went into fleet service with VS-9, later embarked on the 'Essex' (CV-9). This was not to be uneventful; the new aircraft proved problematic during early carrier operations as too many faults began to surface. The type was transferred to VB-17 and Air Group 10 on USS Yorktown. As most of the problems seemed to be structurally related, Mod.I was introduced to address these deficiencies on the first 200 examples, though VB-17's record in April proved to be quite encouraging. Mod. II was introduced at the Norfolk plant. In May, VB-6 and VB-4 operating from the USS Yorktown performed so badly that its commander, Capt J.J. Clark, went as far as to recommend that the entire Helldiver programme should be cancelled!

Mod.III seems to have been the one that cured the worst ailments, 36 such modified examples being delivered to VB-17 embarked on USS Bunker Hill. Meanwhile the SB2C-IC appeared with the originally planned 20mm cannon in the wings and hydraulically-operated flaps, though these went straight to the modification line before being issued to the squadrons. When the 601st aircraft left the production line in November, it was the first to emerge 'fully modified' - at last, the most serious problems seemed to have been overcome.

The baptism of fire for the USN Helldiver came on 11th November 1943, when Air Group 17 on board USS Bunker Hill, led by Lt Cdr J.E. Vose, escorted by Hellcats and Avengers, launched a massive attack against Rabaul. Though defended by a determined band of A6M Zeros, the three successive strikes nearly annihilated the Japanese forces on the ground. The Helldiver was finally acquitting itself with honours both in the dive bombing role, and in repulsing opposing fighter attacks during the strikes and the Japanese counter-attack. Another sortie on 25th December 1943 was uneventful, but on New Year's Day Air Groups 17 and 30 pressed home another difficult attack against a cruiser convoy with great success. It is significant to record that notwithstanding intense anti-aircraft fire and the presence of enemy fighter, no Helldivers were lost in action before the end of January 1944.

Other units began to work up with the new type, such as VB-8 and VB-20. No.1820 Squadron (RN) formed on 1st April 1944 at NAS Squantum, Massachusetts, receiving about twenty-six SBW-1Bs of Canadian production. Though this unit sailed to Great Britain it was never to see action, being disbanded the following December.

By spring of 1944 the SB2C-3 with an uprated engine replaced the SB2C-I on the production lines. VB-17 continued to chalk up an excellent record in the Pacific, while VB-15 met with equal success participating in the devastating attack against Saipan in June. By that time the air war over the sea in that area began to increase in tempo and strikes were flown against Iwo Jima, Chichi Jima and Pagan. By that time the USS Essex had five Helldiver squadrons on board, and on 19th June a massive attack was launched by the Japanese against the USN Task Force in what was to become known as the Battle of the Philippine Sea. The following day, the SB2Cs located the Japanese fleet in the afternoon and just before sunset the attack began, the Japanese suffering the loss of the carrier Hiyo and two oil tankers together with other important naval vessels, while the carrier Zuikaku was extensively damaged. Most of the Japanese carrier-borne aircraft that had survived the battles of the previous days were destroyed for the loss of twenty of the 216 USN attacking aircraft, only four of which were Helldivers. However, only nine SB2Cs survived as landings were performed at night, in great confusion, with aircraft ditching all around the carrier as they ran out of fuel.

OTHER VERSIONS

In December 1940, 100 A-25 Shrikes, the land-based version of the Helldiver, were ordered, the Curtiss-Wright plant at St. Louis being converted to tackle the Army order which eventually went up to 3,000 examples!

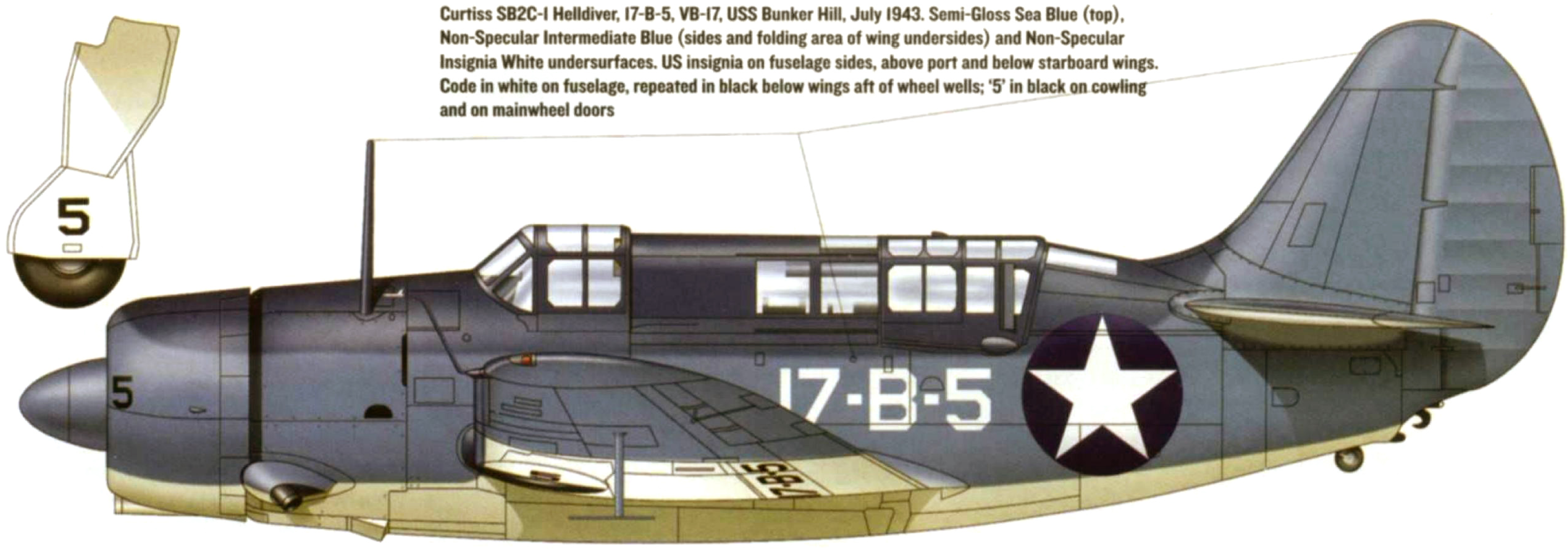
The Shrike suffered similar setbacks to those of the Helldiver, and the first example flew on 29th September 1942. Full production was only reached towards the end of 1943, by which time the US Army considered it had no use for the Shrike although 900 examples left the St. Louis plant before it could be shut down, and of the 150 examples destined for Australia, only 10 were accepted down-under. The balance, together with a further 270, were taken over by the Marines as SB2C-IAs after being suitably modified.

The SB2C-3 solved many of the original problems by having extra power in the form of a 1900hp Wright R-2600-20, driving a four-bladed Curtiss-Electric propeller; the bulbous prop spinner was discarded. Main performance figures increased by around 5% – more in some cases. External modifications included the deletion of the windows just aft of the canopy and, later on, a cleaner one-piece sliding hood for the pilot was introduced. Curtiss produced 1,112 examples of this version, to which one must add the 413 (SBW-3) produced by the Canadian Car & Foundry and 150 (SBF-3) built by Fairchild-Canada. But the ultimate 'Beast' was to be the SB2C-4 of which a total of 2,415 were produced. All the late improvements of the -3, such as clear canopy, extended tailhook and perforated dive-brakes, were incorporated into the -4 which was also fitted with four rocket-launchers under each wing as standard.

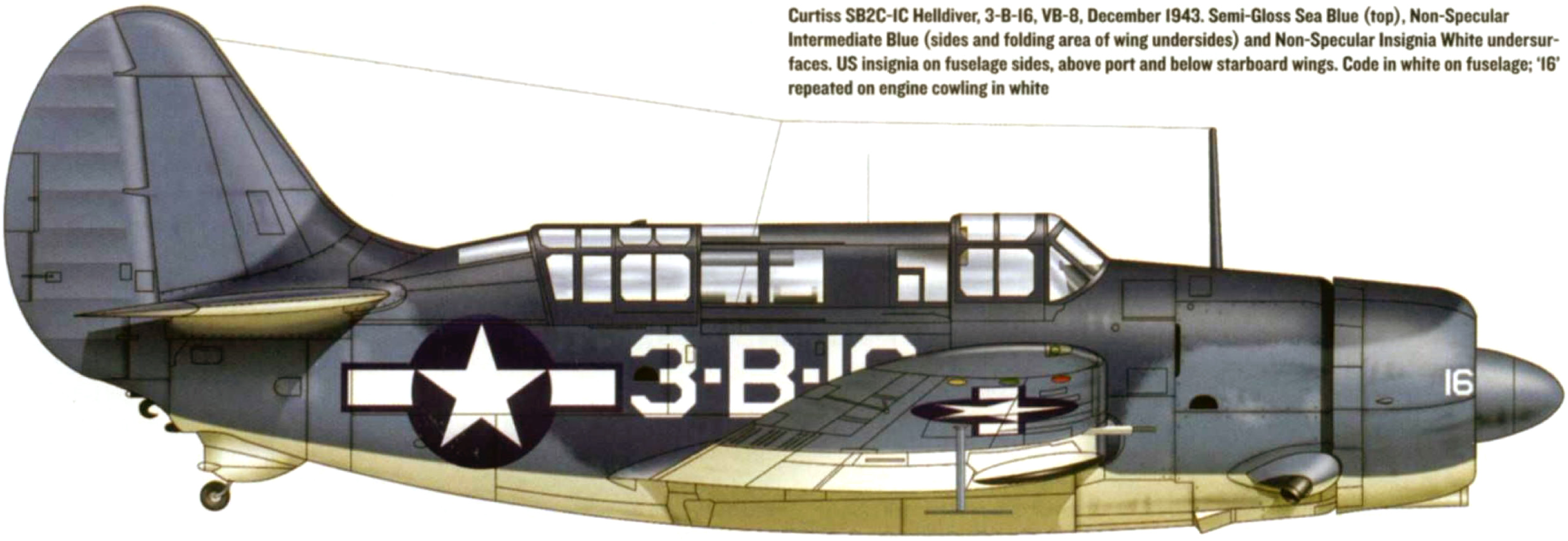
The SB2C-5 can be considered as the post-war Helldiver as very few examples reached active units before the end of the war. 970 were built, though one has to consider that the Navy had – by that time – such faith in the aircraft that it had originally ordered 3,500 of this version. Still, the Helldiver was withdrawn from front-line service by 1950, though a number were retained for training and research purposes. Surplus quantities were supplied to France, Greece, Italy, Portugal and Thailand under the Mutual Defense Aid Program (MDAP). The French were to fly one last desperate operational mission in 1954 during the unsuccessful attempt to relieve the encircled garrison at DienBienPhu, in the troubled Indochina area where the disaster of the Vietnam War would later unfold. It appears that Italy persisted longest with its Helldivers, which were officially retired in exchange for Grumman Trackers only in February 1959. ➛

Below: Fine flying view of a Helldiver in the early three-tone finish of Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces (R.J. Caruana Archives)

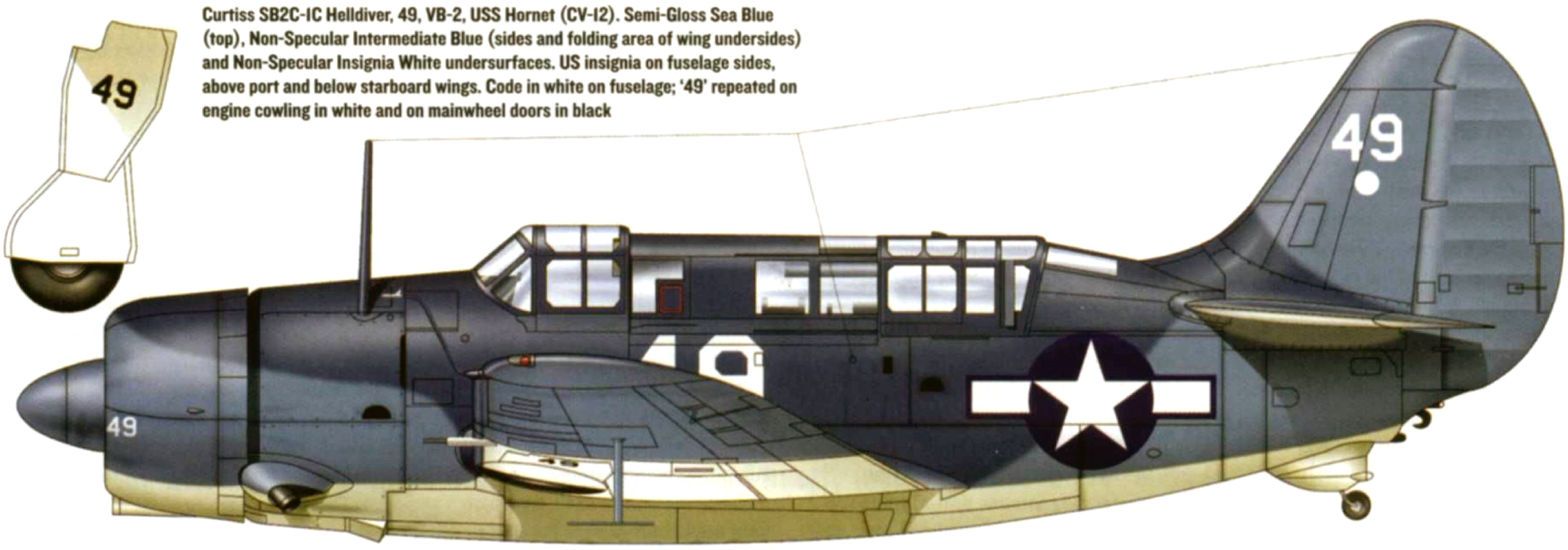
Curtiss SB2C-1 Helldiver, 17-B-5, VB-17, USS Bunker Hill, July 1943. Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces. US insignia on fuselage sides, above port and below starboard wings. Code in white on fuselage, repeated in black below wings aft of wheel wells; '5' in black on cowling and on mainwheel doors



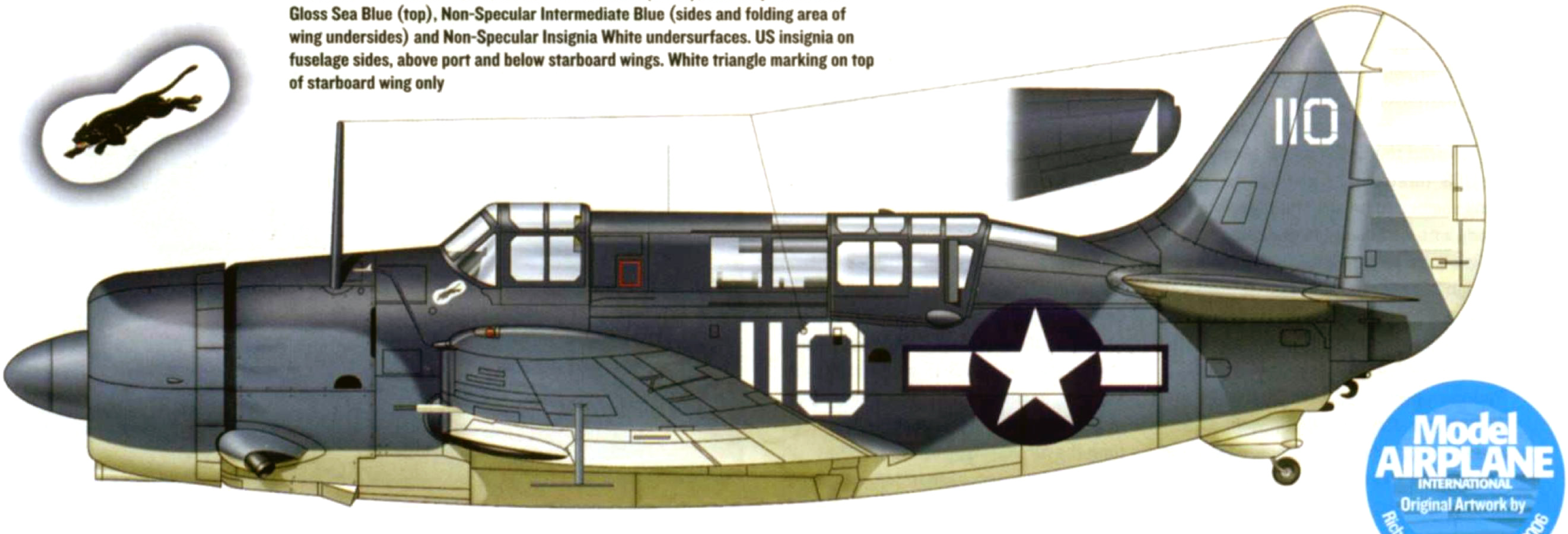
Curtiss SB2C-1C Helldiver, 3-B-16, VB-8, December 1943. Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces. US insignia on fuselage sides, above port and below starboard wings. Code in white on fuselage; '16' repeated on engine cowling in white



Curtiss SB2C-1C Helldiver, 49, VB-2, USS Hornet (CV-12). Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces. US insignia on fuselage sides, above port and below starboard wings. Code in white on fuselage; '49' repeated on engine cowling in white and on mainwheel doors in black



Curtiss SB2C-3 Helldiver, 110, VB-3, USS Yorktown (CV-10), February 1945. Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces. US insignia on fuselage sides, above port and below starboard wings. White triangle marking on top of starboard wing only



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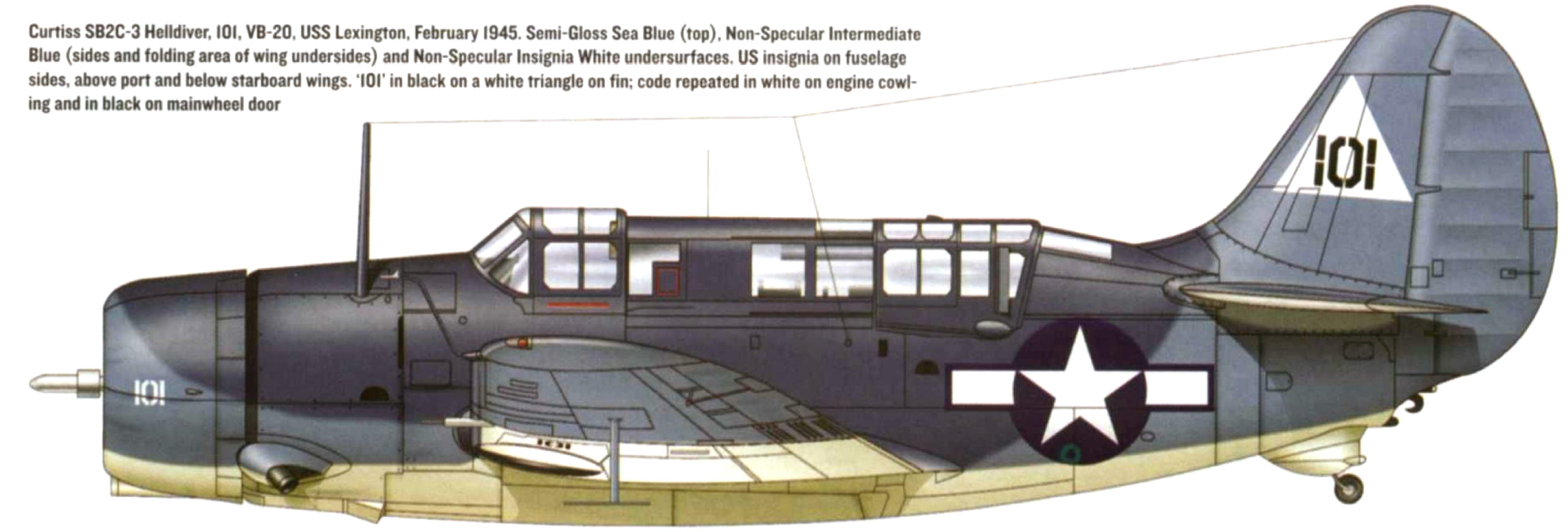
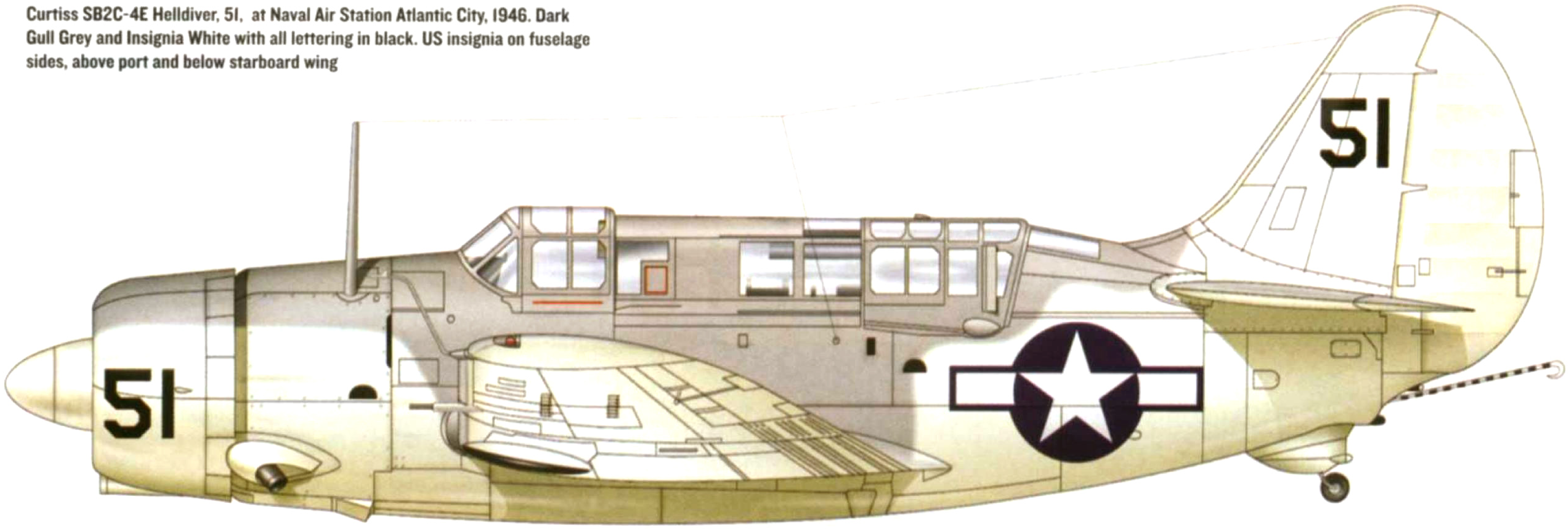
Curtiss SB2C-3 Helldiver, 101, VB-20, USS Lexington, February 1945. Semi-Gloss Sea Blue (top), Non-Specular Intermediate Blue (sides and folding area of wing undersides) and Non-Specular Insignia White undersurfaces. US insignia on fuselage sides, above port and below starboard wings. '101' in black on a white triangle on fin; code repeated in white on engine cowling and in black on mainwheel door

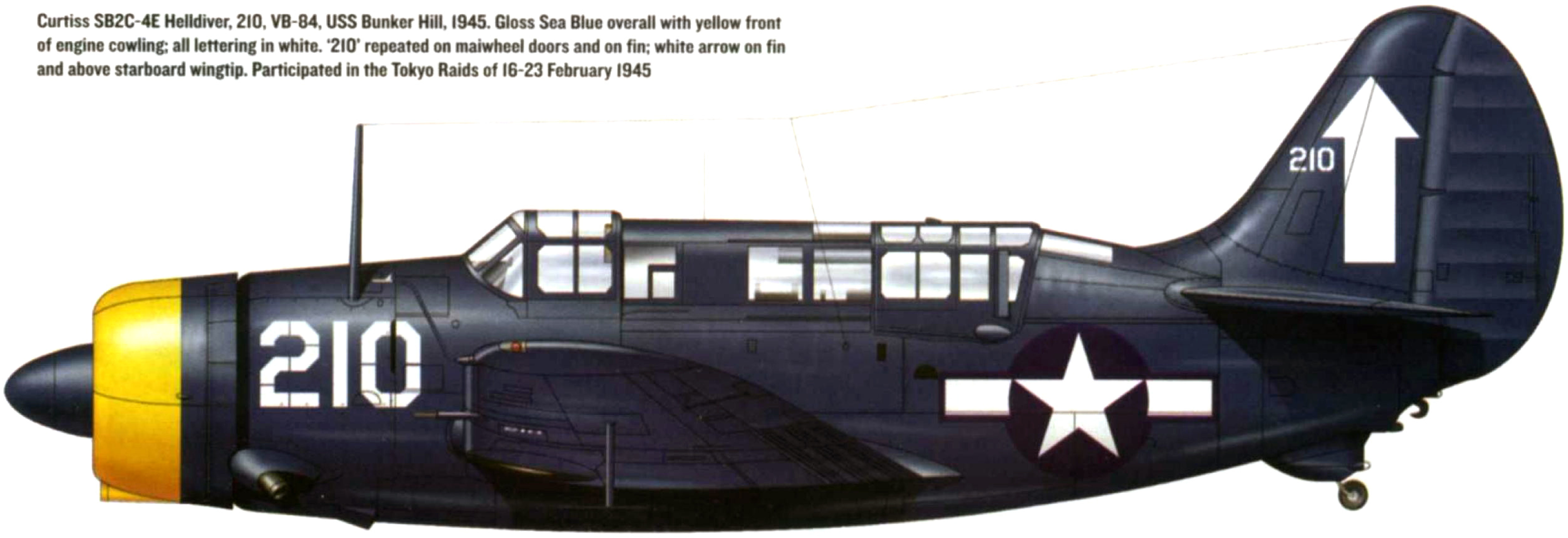


Curtiss SB2C-4E Helldiver, 51, at Naval Air Station Atlantic City, 1946. Dark Gull Grey and Insignia White with all lettering in black. US insignia on fuselage sides, above port and below starboard wing

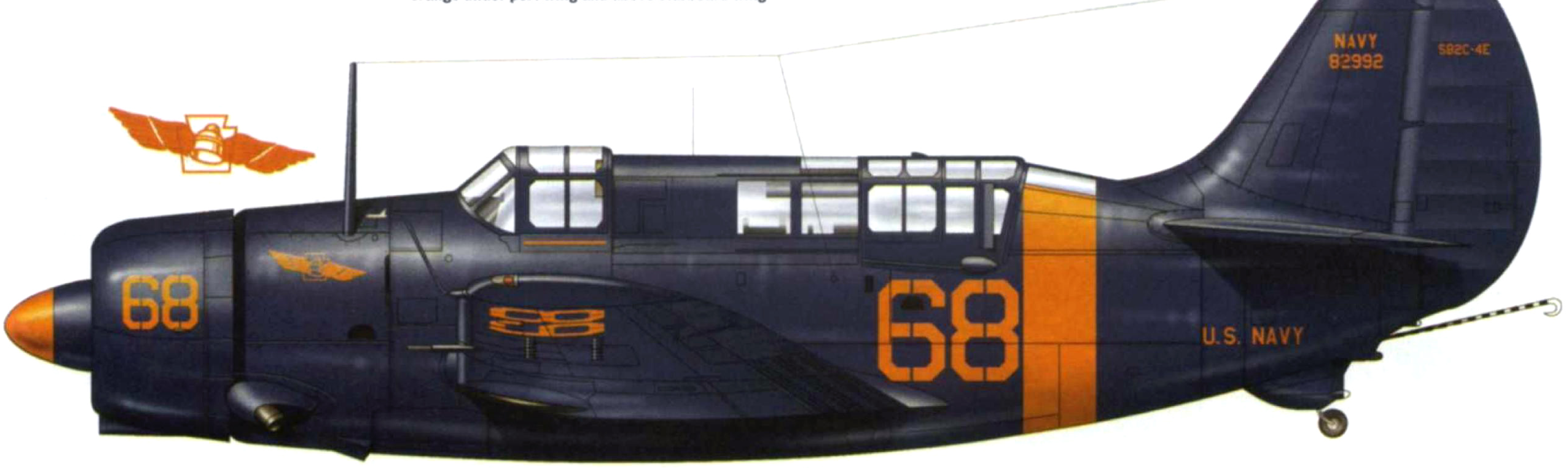


Curtiss SB2C-5 Helldiver, VT-76 (Air Group 75), USS Franklin D. Roosevelt (CVB-42), mid-1946. Glossy Sea Blue overall with red band across vertical tail surfaces; white codes on band and '5', also in white, on fin, below cockpit and on cowling. US insignia on fuselage sidea, above port and below starboard wings

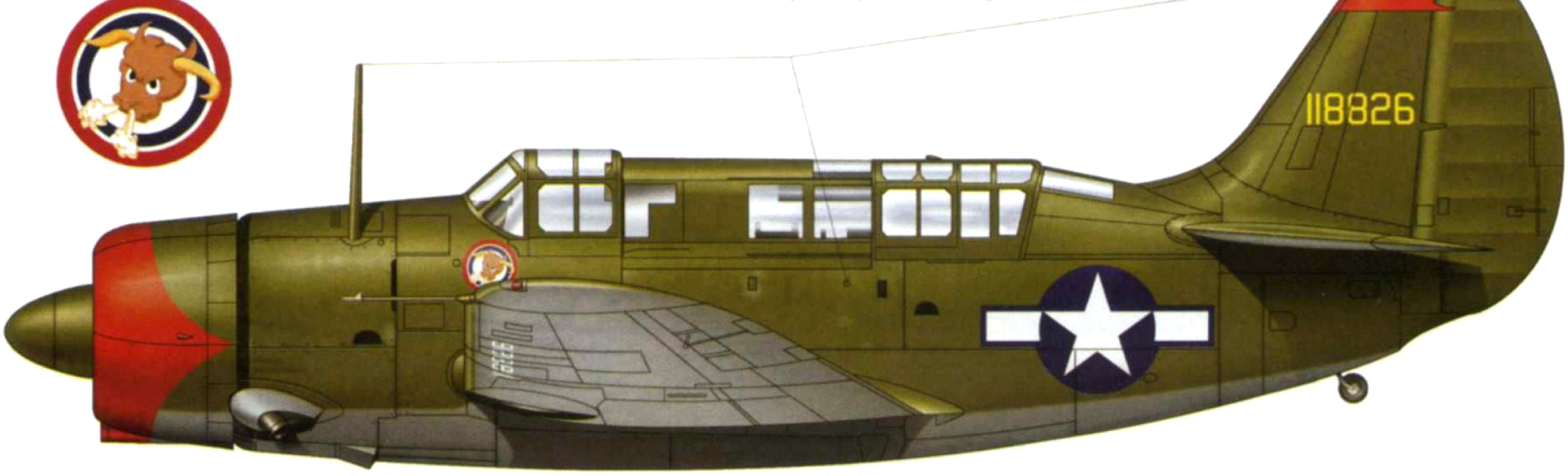
Curtiss SB2C-4E Helldiver, 210, VB-84, USS Bunker Hill, 1945. Gloss Sea Blue overall with yellow front of engine cowling; all lettering in white. '210' repeated on maiwheel doors and on fin; white arrow on fin and above starboard wingtip. Participated in the Tokyo Raids of 16-23 February 1945



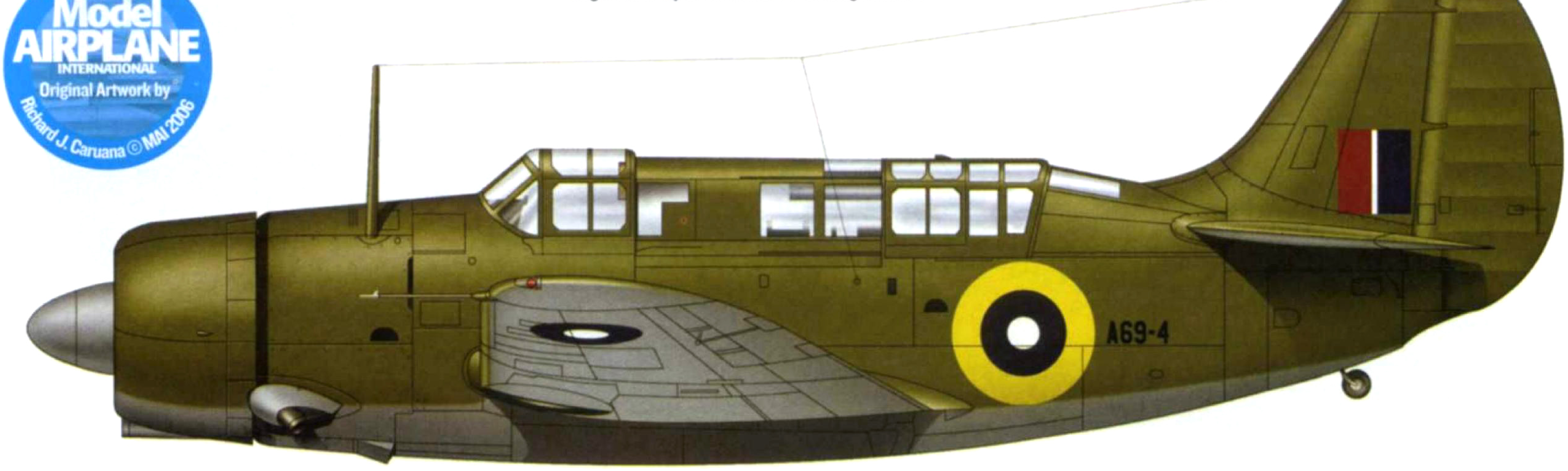
Curtiss SB2C-4E Helldiver, 82992/68, of the US Navy Reserve, 1947. Gloss Sea Blue overall with orange markings and lettering. US insignia (with red central bar) above port and under starboard wing. "68" in orange under port wing and above starboard wing



Curtiss A-25A-10-CS, 41-18826, of the 13th Fighter Squadron, Florida 1944. Olive Drab/Neutral Grey finish with red trim to engine cowling and top of fin; US insignia on fuselage sides, above port and below starboard wings. Serial on fin in yellow, repeated below wings in white



Curtiss A-25 Shrike, A69-4, one of ten delivered to the Royal Australian Air Force (ex-42-79686) in standard USAF finish of Olive Drab/Neutral Grey with RAF style fin flashes and large areas of yellow around the fuselage roundel



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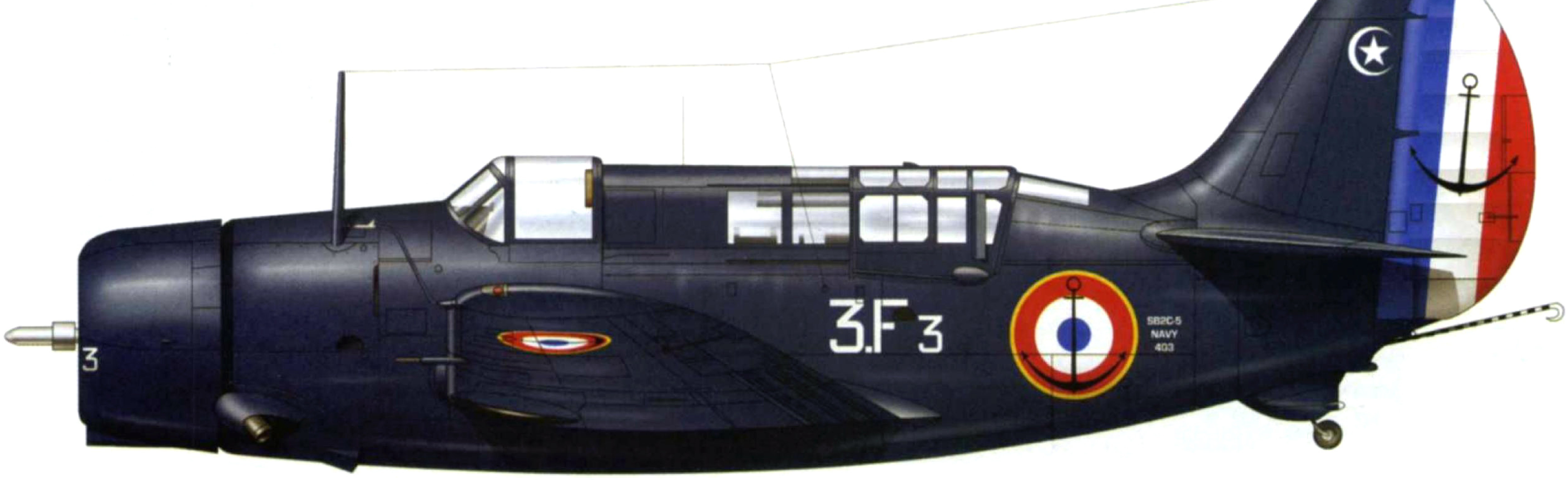
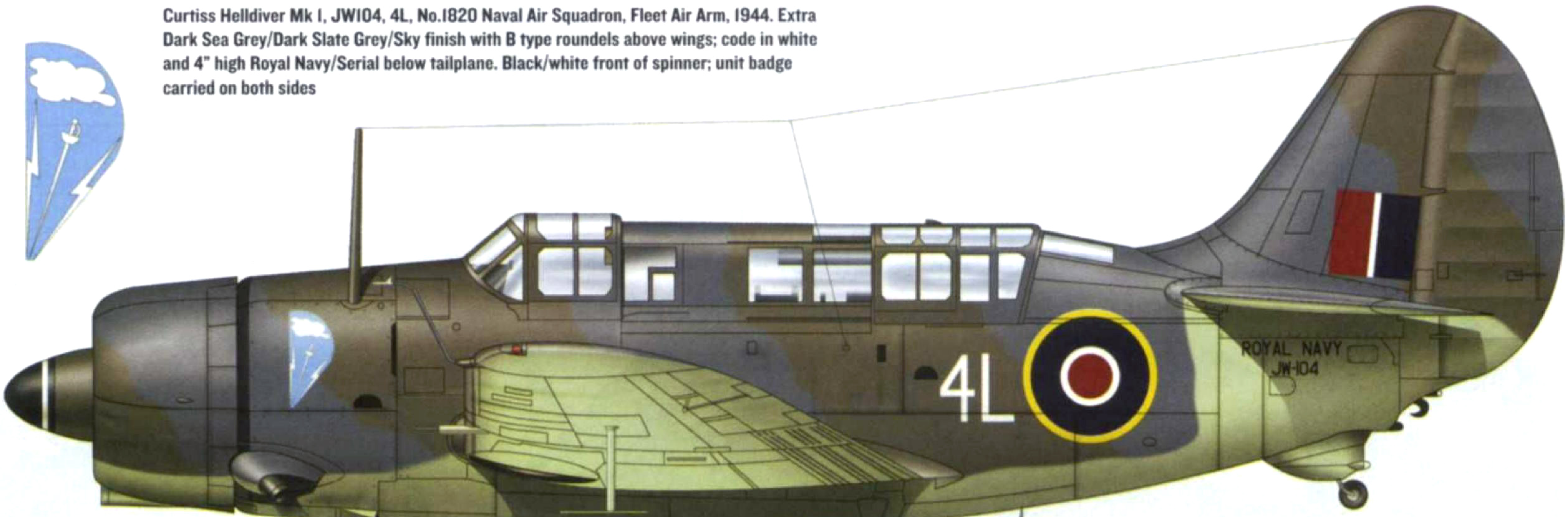
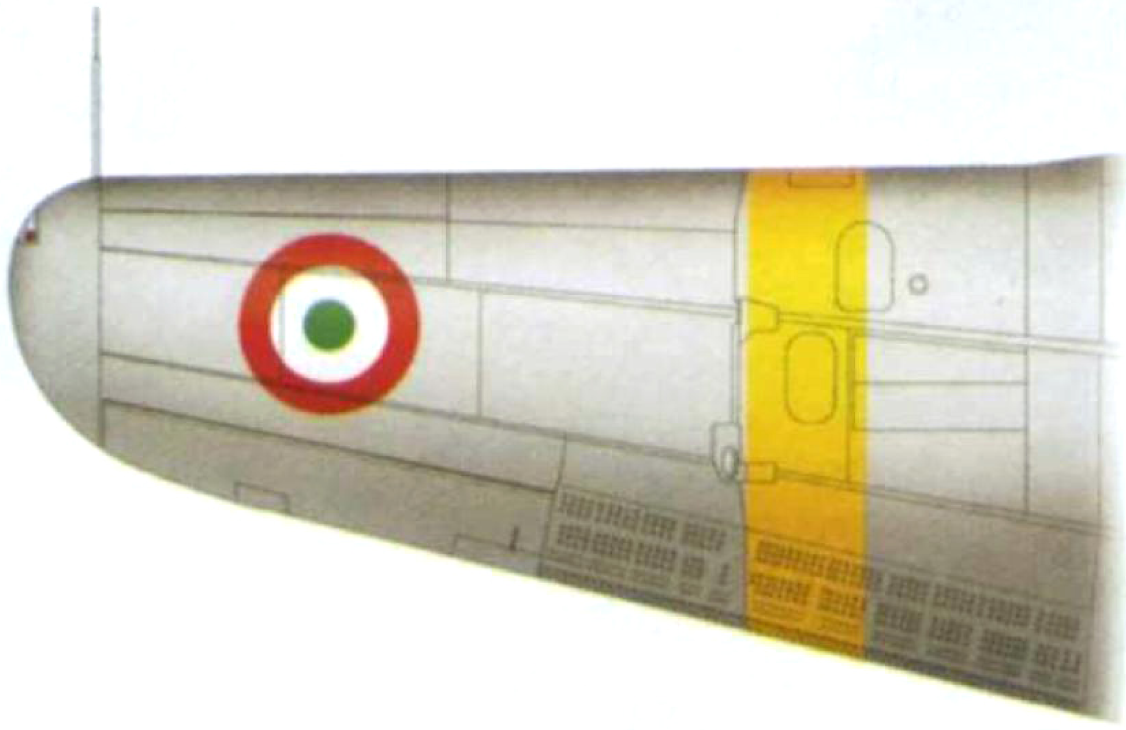
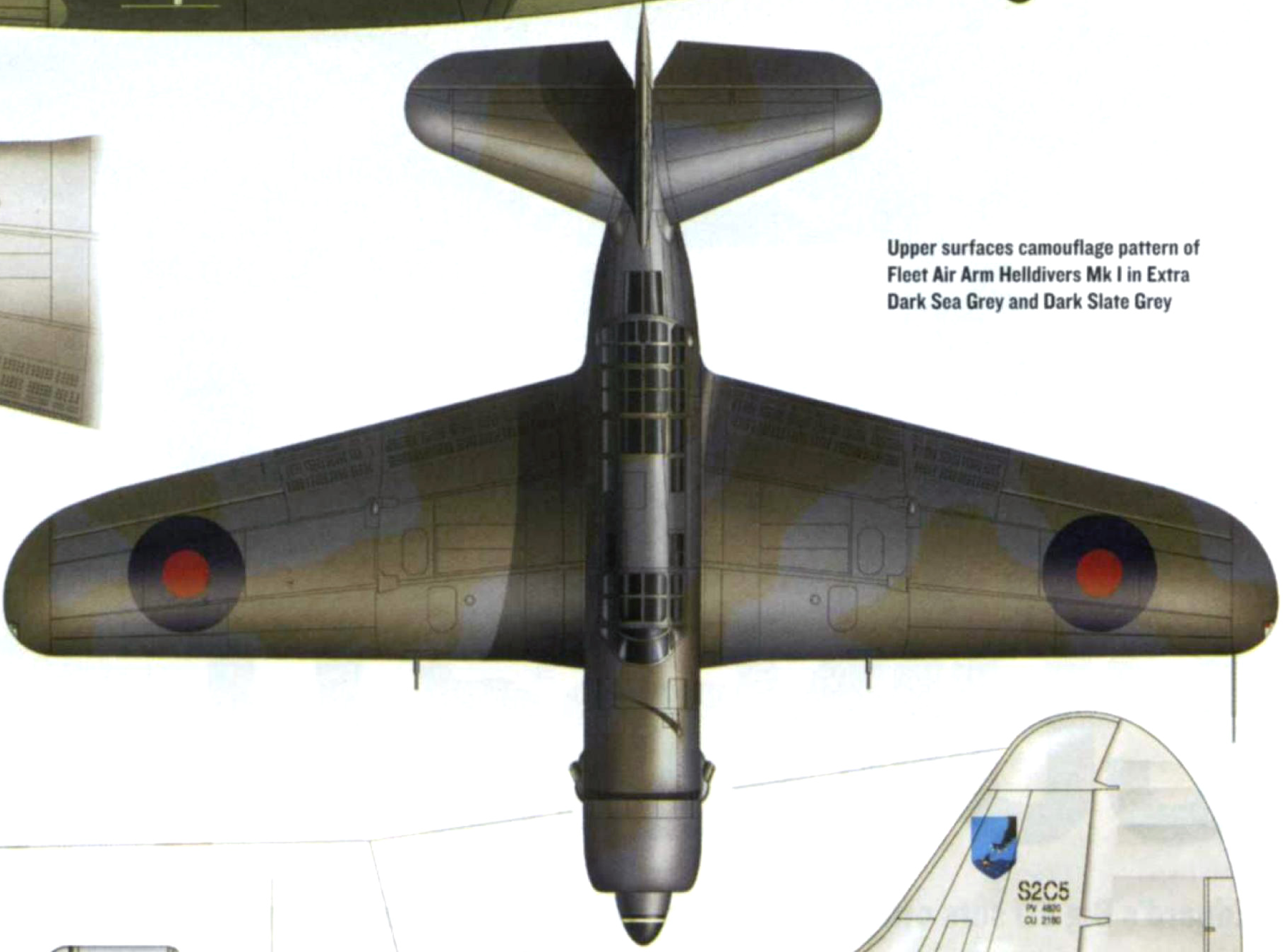
Curtiss SB2C-5 Helldiver, 403/3F.3, of Esc3F, Aeronavale (French Navy), Arromanches, 1952. Gloss Sea Blue overall with white lettering; national markings in six positions



Curtiss Helldiver Mk I, JW104, 4L, No.1820 Naval Air Squadron, Fleet Air Arm, 1944. Extra Dark Sea Grey/Dark Slate Grey/Sky finish with B type roundels above wings; code in white and 4" high Royal Navy/Serial below tailplane. Black/white front of spinner; unit badge carried on both sides

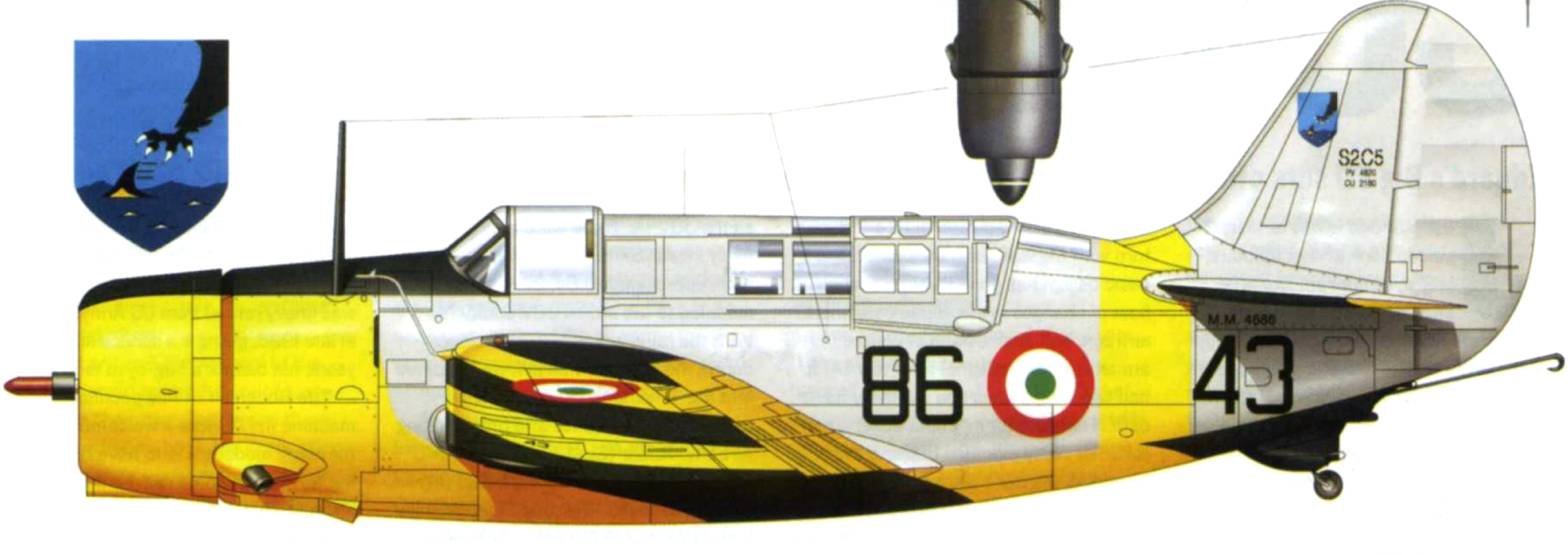




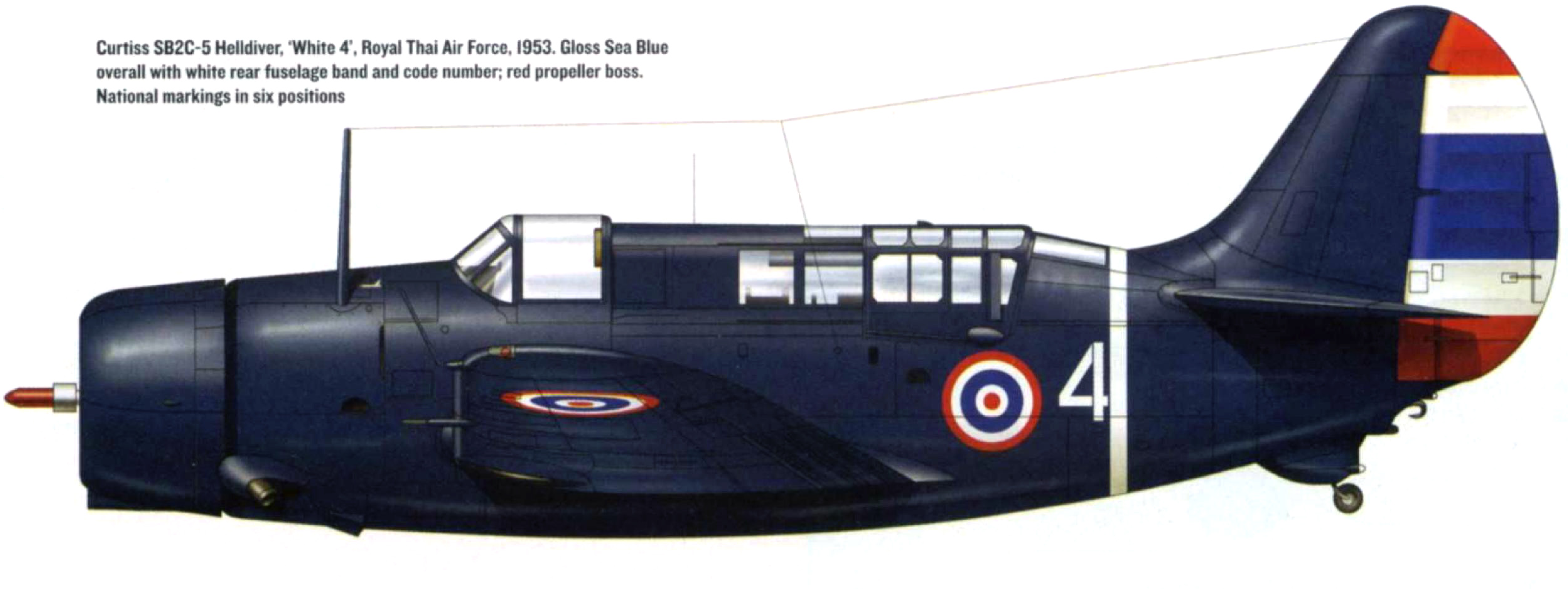


Upper surfaces camouflage pattern of Fleet Air Arm Helldivers Mk I in Extra Dark Sea Grey and Dark Slate Grey

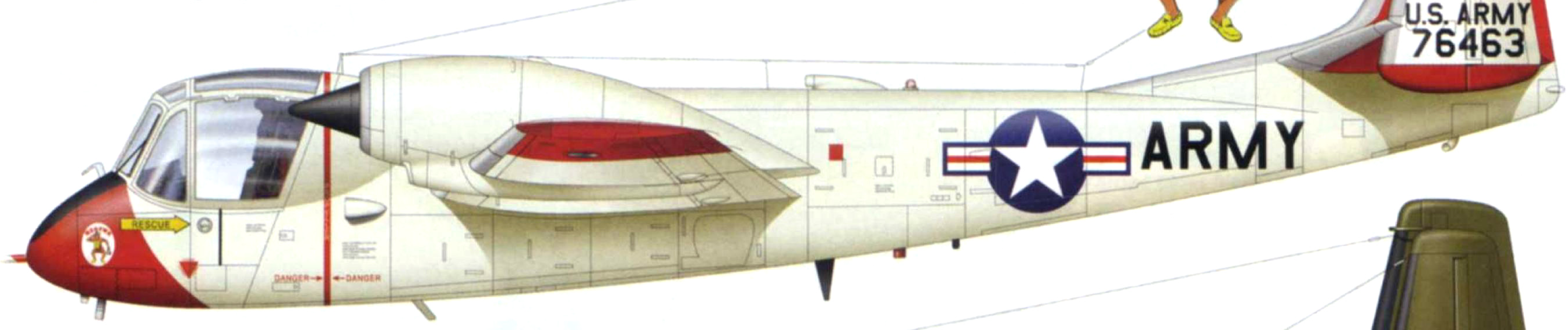
Above and Below: Curtiss S2C-5 Helldiver, MM.4686/86-43, Italian Air Force converted to target tug duties after the war and which continued to fly up to July 7, 1958 when it was destroyed in a fire. Silver overall with black anti-dazzle panel; yellow/black undersides. Yellow band around rear fuselage and chord-wise above wings; all lettering in black. Note '43' repeated on mainwheel doors



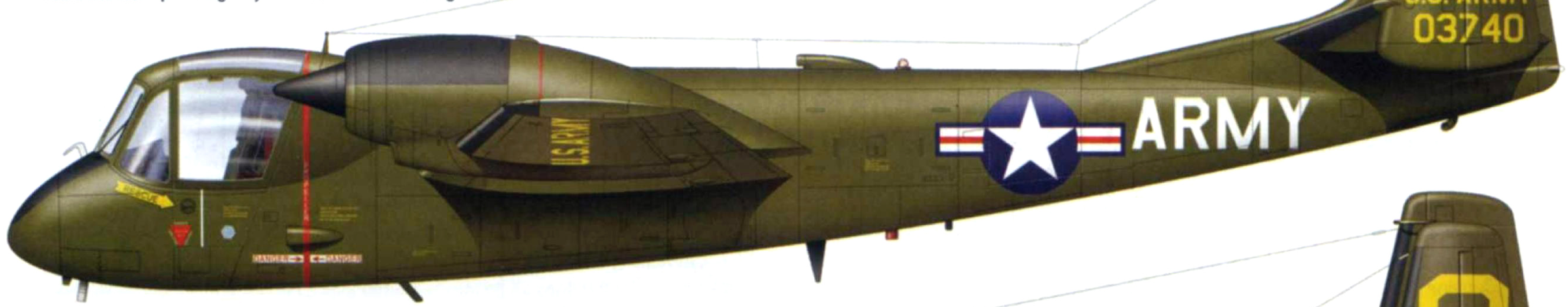
Curtiss SB2C-5 Helldiver, 'White 4', Royal Thai Air Force, 1953. Gloss Sea Blue overall with white rear fuselage band and code number; red propeller boss. National markings in six positions



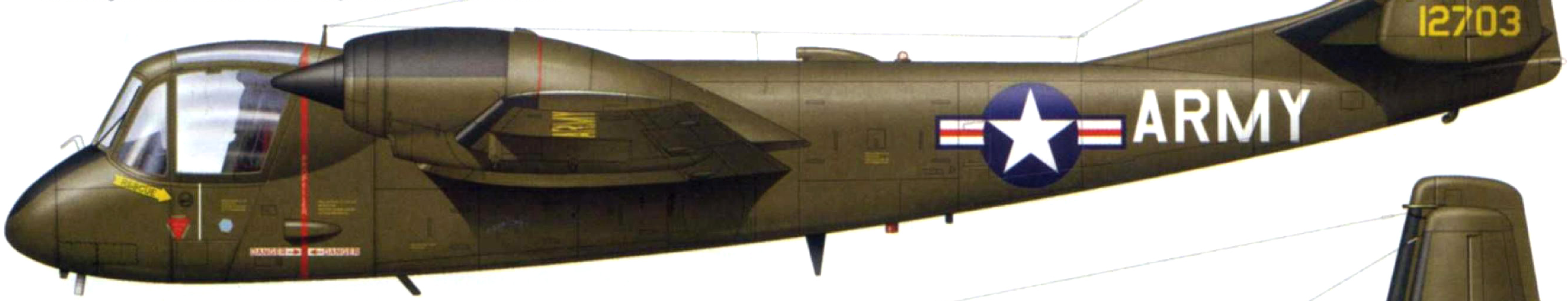
YOA-1AF Mohawk, S/No.57-6463, first Service Test Aircraft, summer 1959. White overall with red trim; black lettering, anti-dazzle panel and spinners. 'Mohawk' motif on nose in a white patch; note long nose probe shown in scrap view



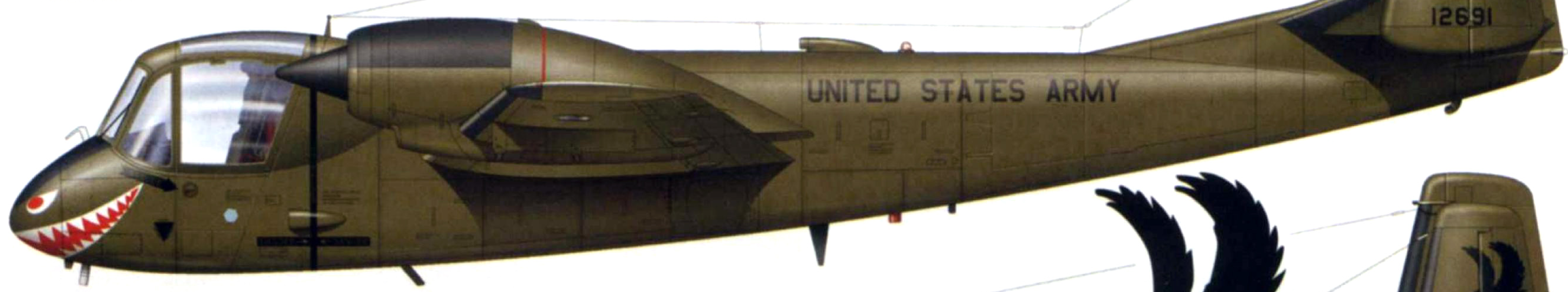
OV-1A Mohawk, S/No.60-3740, U.S. Army, Fort Rucker, 1984. Olive Drab overall with black anti-dazzle panel, spinners, flying surfaces' leading edges and top of engine cowlings; lettering on fins, above starboard and below port wings in yellow. 'US ARMY' on fuselage in white



OV-1C Mohawk, S/No.61-2703, 'Yellow 9', 23rd Special Warfare Aviation Detachment, U.S. Army, Vietnam, 1963. Olive Drab overall with black anti-dazzle panel, spinners, flying surfaces' leading edges and top of engine cowlings; lettering on fins, above starboard and below port wings in yellow. 'US ARMY' on fuselage in white. Crashed at Kien Giang, Vietnam 10th September, 1969



OV-1C Mohawk, S/No.61-2691, 1st Infantry Division, US Army, Phy Loi, Vietnam, 1967. Olive Drab overall with all lettering in black, except for '1' in red on a white shield on rudders; red/white 'sharkmouth' motif on nose. Crashed at Tuyen Duc, Vietnam, 14th October 1969



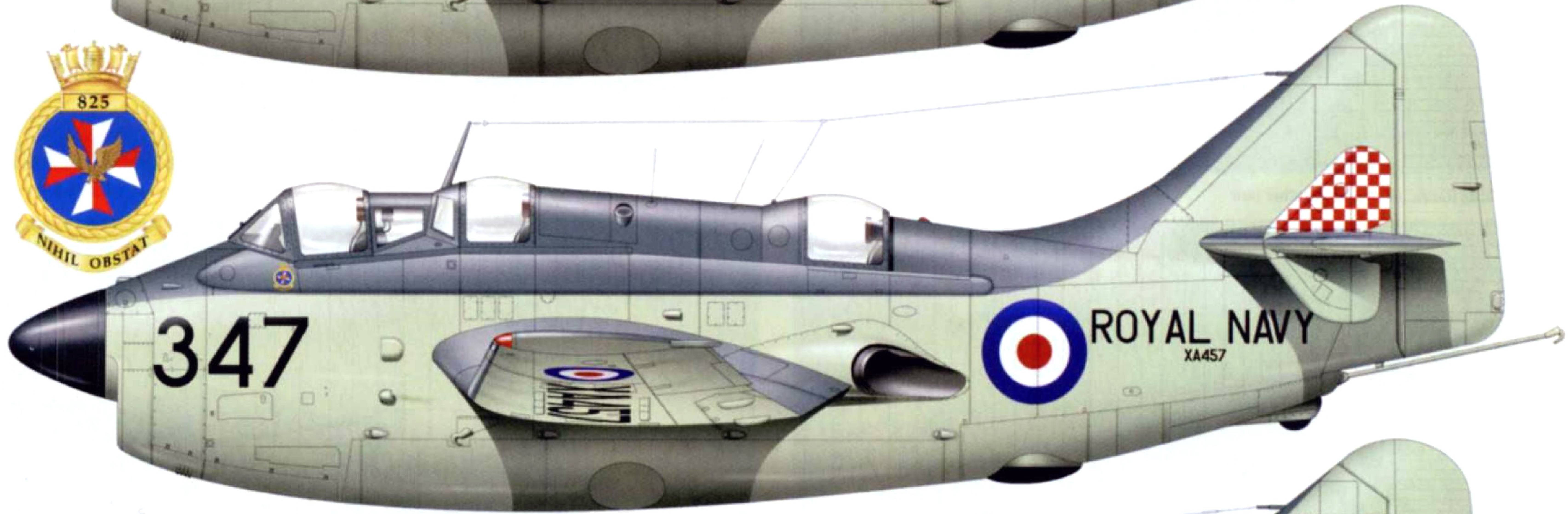
OV-1C Mohawk, S/No.66-18887, 'Yellow 23', 131st SAC, Phu Bai, Vietnam, 1971. Olive Drab overall with all lettering in black, except '23' on fins/rudders; unit badge on fins/rudders in black with white and yellow detail

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

04387 Focke Wulf FW 200 C-5/C-8 Condor, 1:72

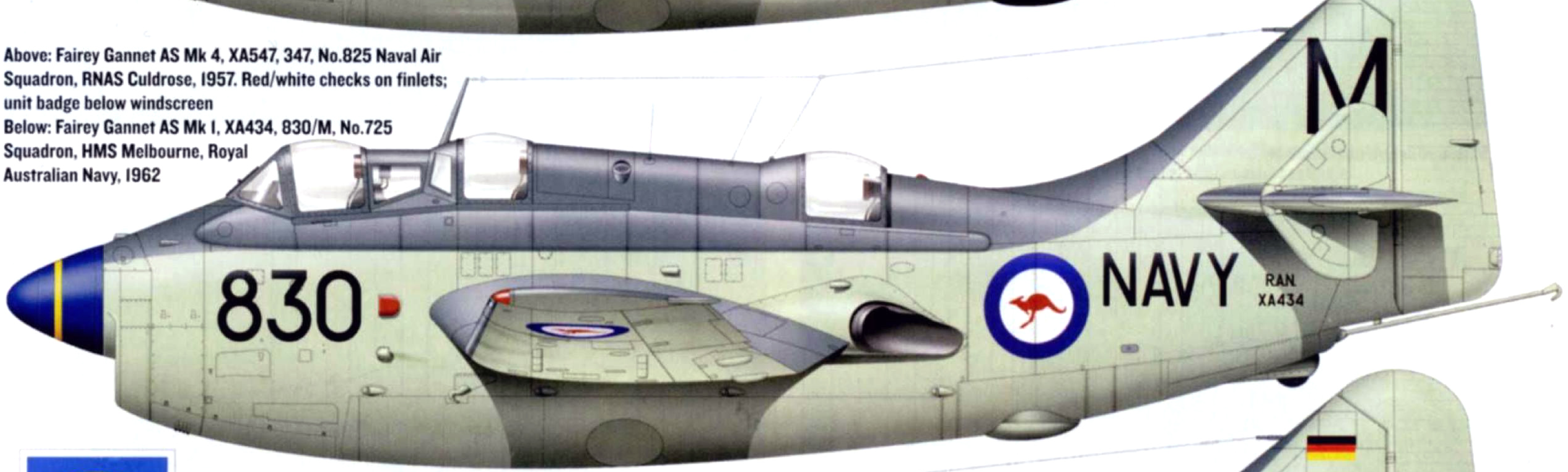
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2007

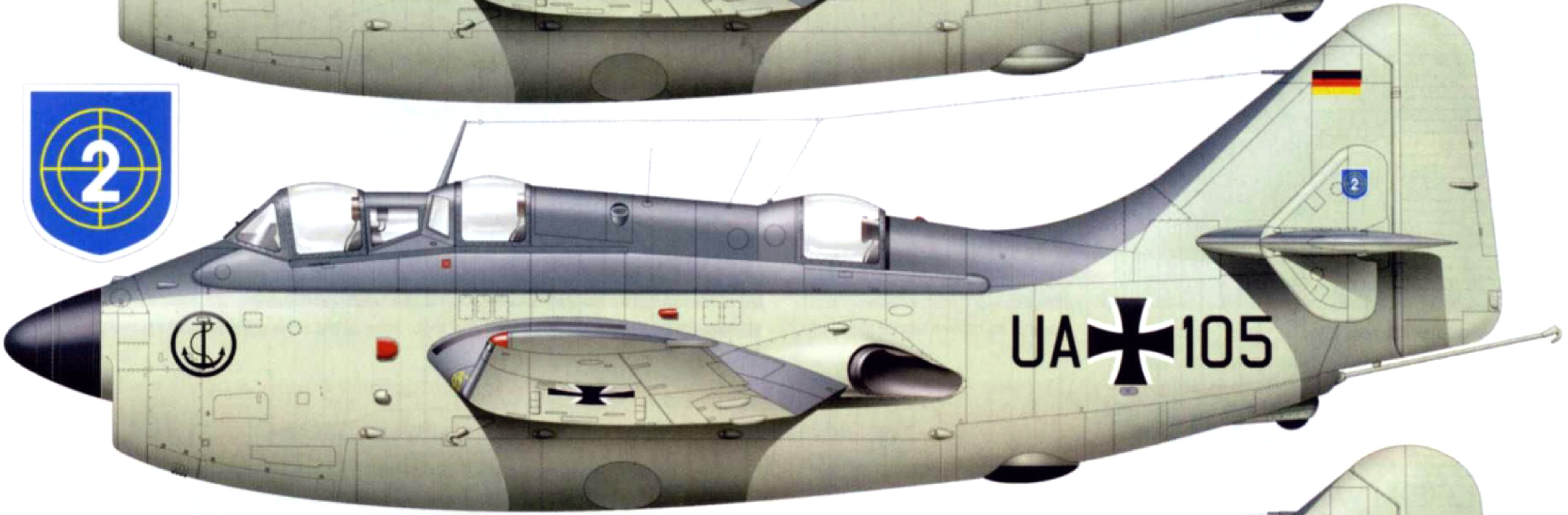
Fairey Gannet AS Mk I, WN450, 337/O, No.824 Naval Air Squadron, HMS Ark Royal, 1956. Extra Dark Sea Grey/Sky finish with black spinner and lettering; roundels in six positions. Serial repeated below wings, reading from leading edge below port and from trailing edge below starboard, reading from leading edge below port and from trailing edge below starboard; unit crest on fin



Above: Fairey Gannet AS Mk 4, XA547, 347, No.825 Naval Air Squadron, RNAS Culdrose, 1957. Red/white checks on finlets; unit badge below windscreen

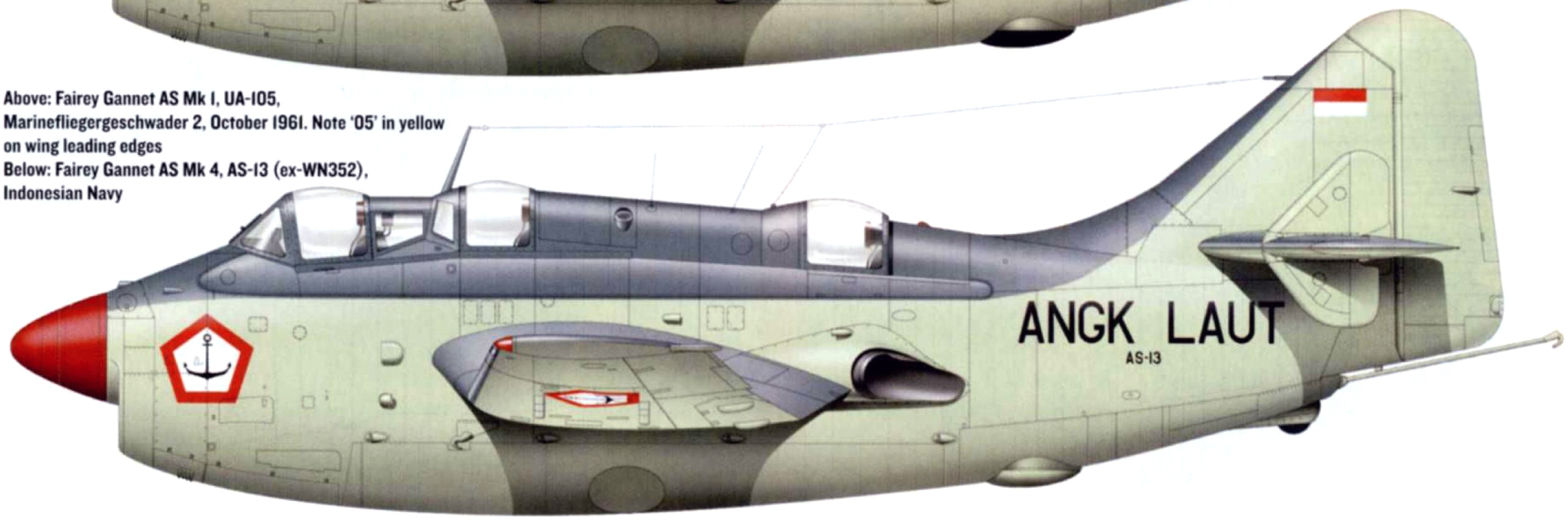
Below: Fairey Gannet AS Mk I, XA434, 830/M, No.725 Squadron, HMS Melbourne, Royal Australian Navy, 1962





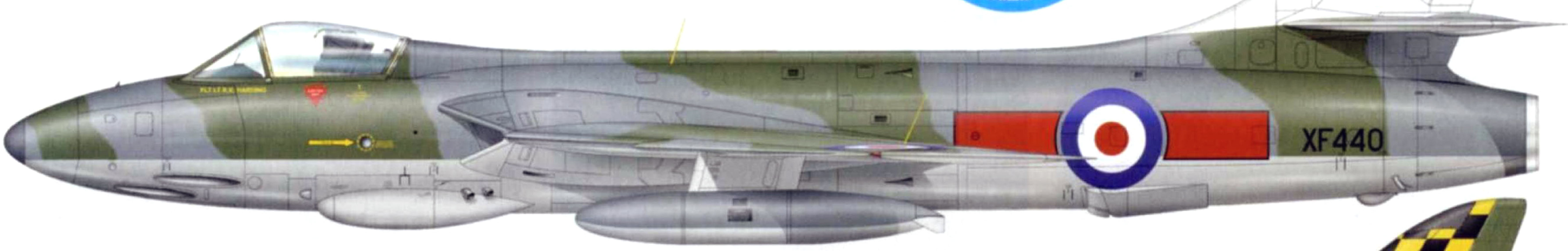
Above: Fairey Gannet AS Mk I, UA-105, Marinefliegergeschwader 2, October 1961. Note '05' in yellow on wing leading edges

Below: Fairey Gannet AS Mk 4, AS-13 (ex-WN352), Indonesian Navy

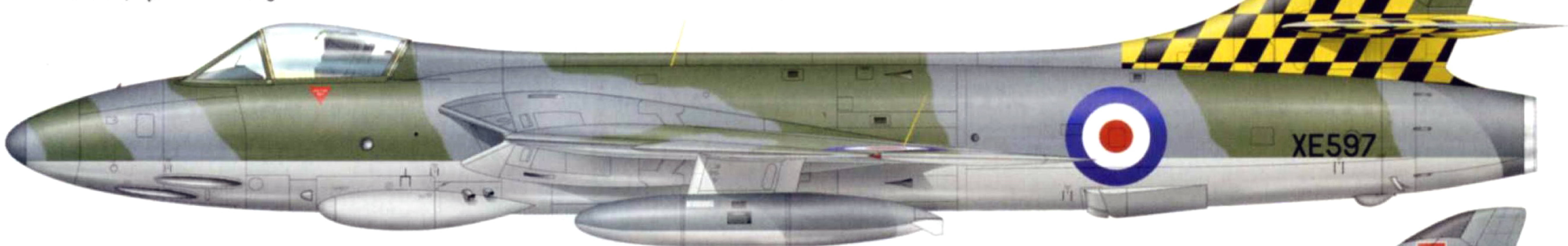


Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2007

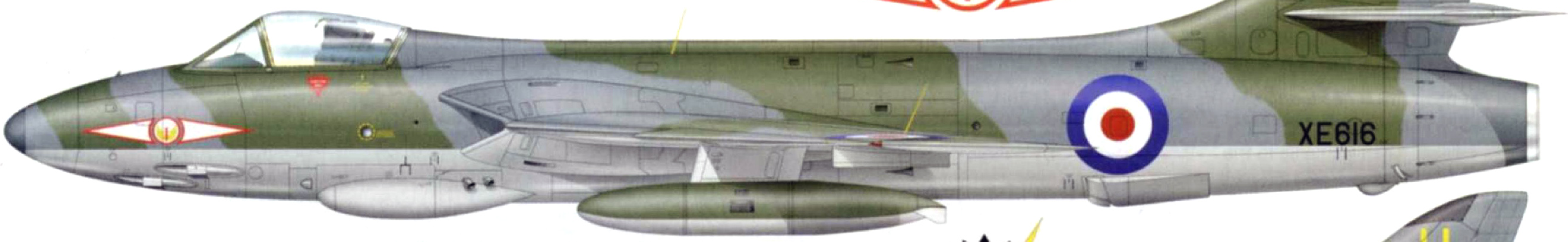
Hunter F Mk 6, XF440/D, No.247 Squadron, RAF Odiham, 1957. Dark Sea Grey/Dark Green/Aluminium finish with white fin/rudder; black serial, repeated below wings. Red rectangles, bordered in black, flanking fuselage roundel; code on fin in black, repeated on front nosewheel door. Pilot's name (Flt Lt R.R. Harding) in yellow below windscreen



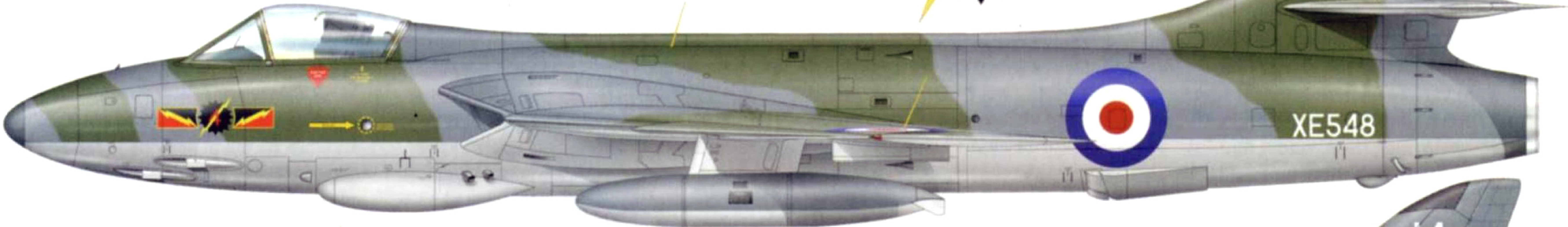
Hunter F Mk 6, XE597, flown by the CO of No.63 Squadron, RAF Waterbeach, 1958. Dark Sea Grey/Dark Green/Aluminium finish with yellow/black checks on fin and fixed areas of horizontal tail surfaces; serial in black, repeated below wings



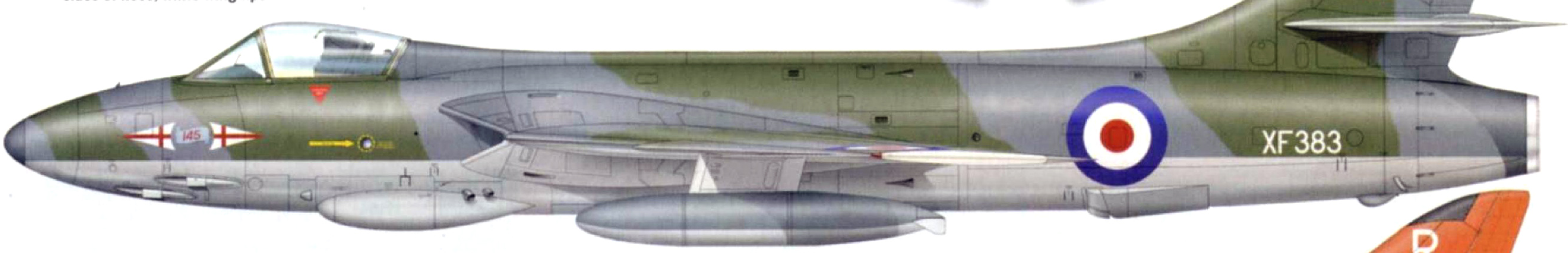
Hunter F Mk 6, XE616/E, No.1 Squadron, RAF Stradishall, March 1959. Dark Sea Grey/Dark Green/Aluminium finish; serial in black, repeated below wings. Code 'E' in red, outlined in white, on fin, repeated in black on front nosewheel door. Unit badge on a white disk, outlined in red, flanked by white flashes, outlined in red, on nose



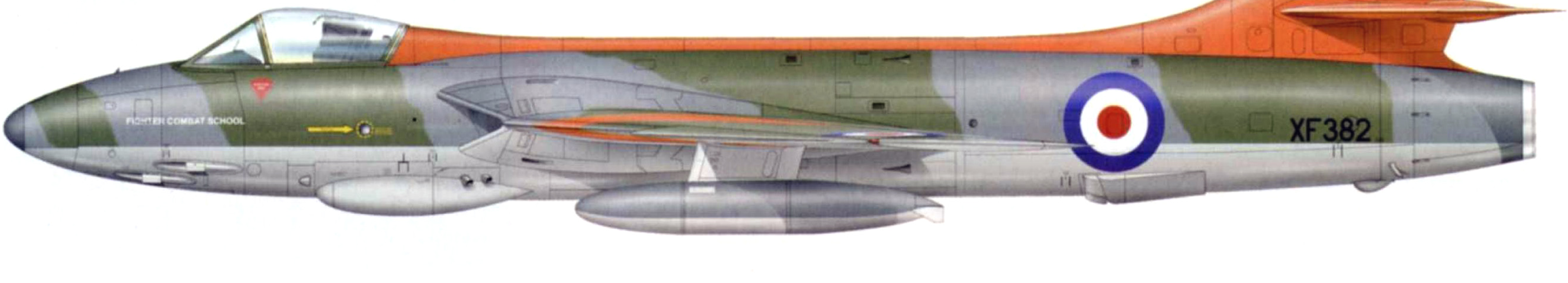
Hunter F Mk 6, XE548/H, No.4 Squadron, RAF Waddington, September 1960. Dark Sea Grey/Dark Green/Aluminium finish; serial in white on fuselage sides, repeated below wings in black. Code 'H' on fin in yellow, repeated in black on front nosewheel door; unit badge, flanked by black/red bars, outlined in yellow, with yellow flashes superimposed



Hunter F Mk 6, XF383/14, No.145 Squadron, RAF Alconbury, June 1961. Dark Sea Grey/Dark Green/Aluminium finish with roundels in six positions; serial and code in white (the former repeated in black below wings). Unit badge on both sides of nose; white wing tips



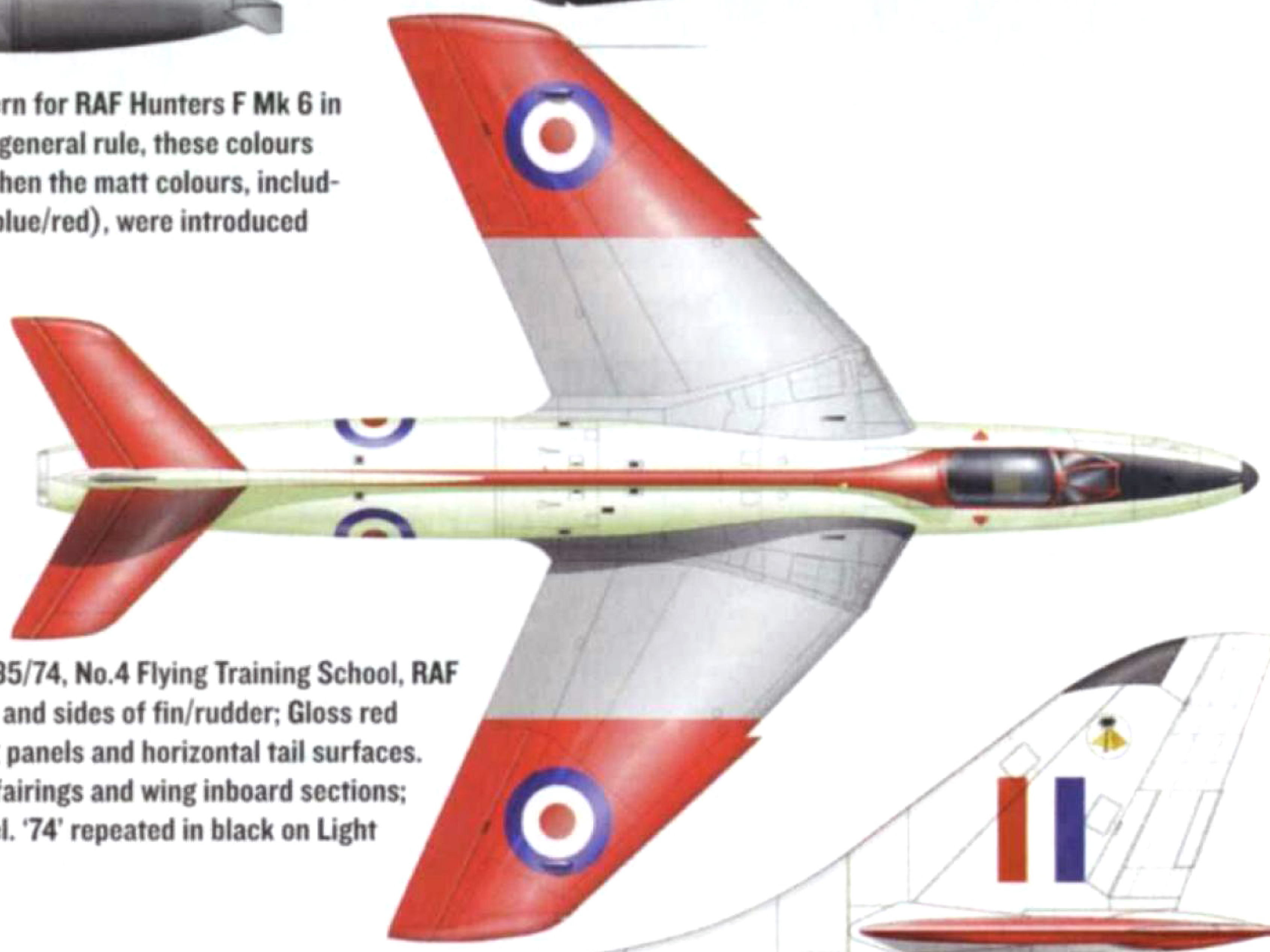
Hunter F Mk 6, XF382/R, Fighter Combat School, RAF Stradishall, 1961. Dark Sea Grey/Dark Green/Aluminium finish with orange spine, tail and wing bands; serial in black, repeated below wings. Title on nose in white; code 'R' in white on fin, repeated in black on front nose wheel door



Hunter F Mk 6, XE608/32, No.229 OCU, RAF Chivenor, 1972. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with national markings in blue/red; serial in black, repeated below wings. No.63 Squadron markings on nose; '32' in black within a yellow disc on fin

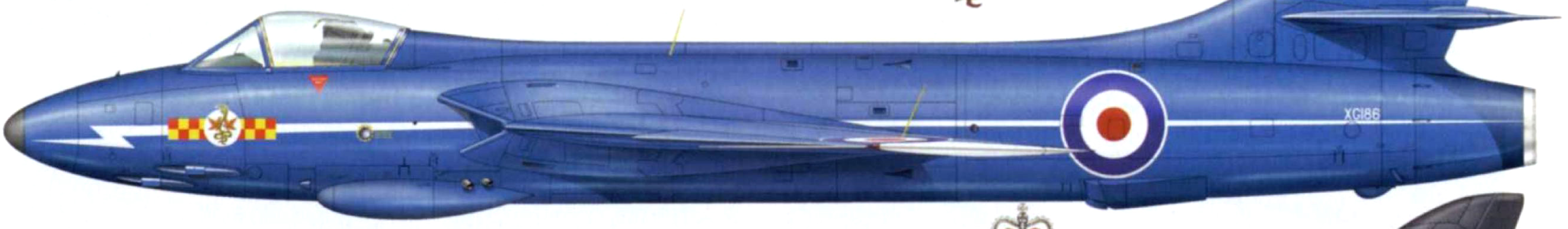
Hunter F Mk 6, XF383, No.12 Squadron, RAF Honington, mid-1984. Wrap-around finish of Dark Sea Grey/Dark Green with blue/red roundels and fin flash; serial in black, repeated below wings. Unit badge on nose

Left: Typical upper camouflage pattern for RAF Hunters F Mk 6 in Dark Sea Grey and Dark Green. As a general rule, these colours were high gloss up to around 1970 when the matt colours, including toned-down national markings (blue/red), were introduced



Below and Above Right: Hunter F Mk 6, XG185/74, No.4 Flying Training School, RAF Valley. Gloss white top decking to fuselage and sides of fin/rudder; Gloss red undersides of fuselage, spine, outer wing panels and horizontal tail surfaces. Gloss Light Aircraft Grey engine intake fairings and wing inboard sections; black serial/code and anti-dazzle panel. '74' repeated in black on Light Aircraft Grey nose wheel door

Hunter F Mk 6, DG186/F, No.92 Squadron 'Blue Diamonds', 1961-62. Medium Blue overall with white flash along fuselage sides; white wing tips. Roundels and fin flash outlined in white; small serial in white on rear fuselage. Unit badge flanked by yellow/red checks on nose; 'F' in white on front nosewheel door



Hunter F Mk 6, XF506/X, flown by Sqn Ldr Peter Latham AFC, CO of No.111 Squadron 'Black Arrows', October 1958. High gloss black overall with roundels and fin flash outlined in white; serial in red on rear fuselage side only. Code 'X' in red on front nosewheel door; unit crest flanked by black/yellow bars on nose, together with pilot's name in yellow and rank pennant

PHOTO FEATURE

This selection of images should help those building the Revell Hunter, as they show those areas in the RAF Museum and IWM collections' FGA Mk 9s that are common with the earlier Mk 6 All photos © G. Coughlin

This is the ventral airbrake, under the rear fuselage

The gun ports of the 30mm cannon on either side of the nose

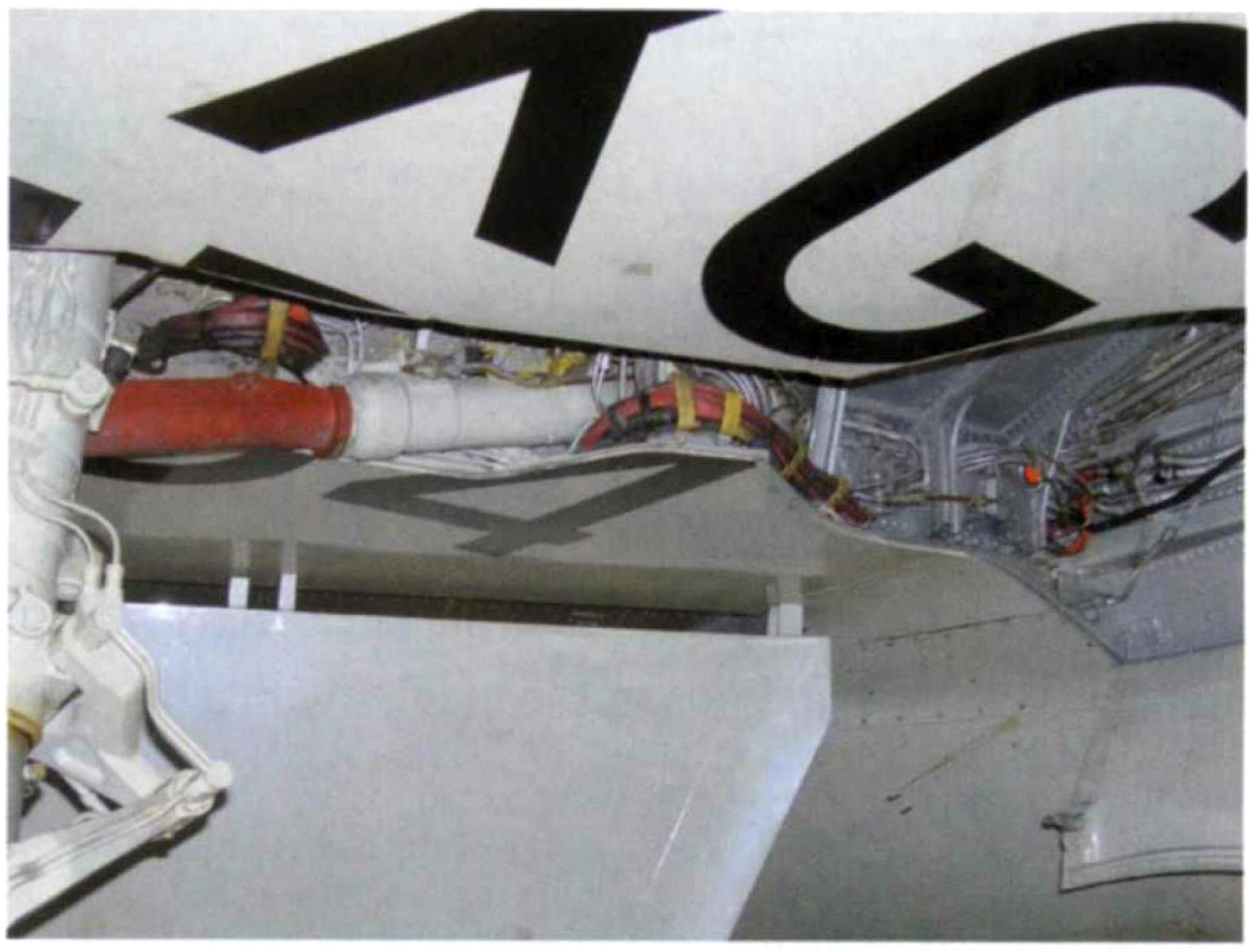
The inboard flap area, only exposed like this because the hydraulic pressure has drained away causing them to hang down at 90°

The starboard main oleo viewed from directly in front

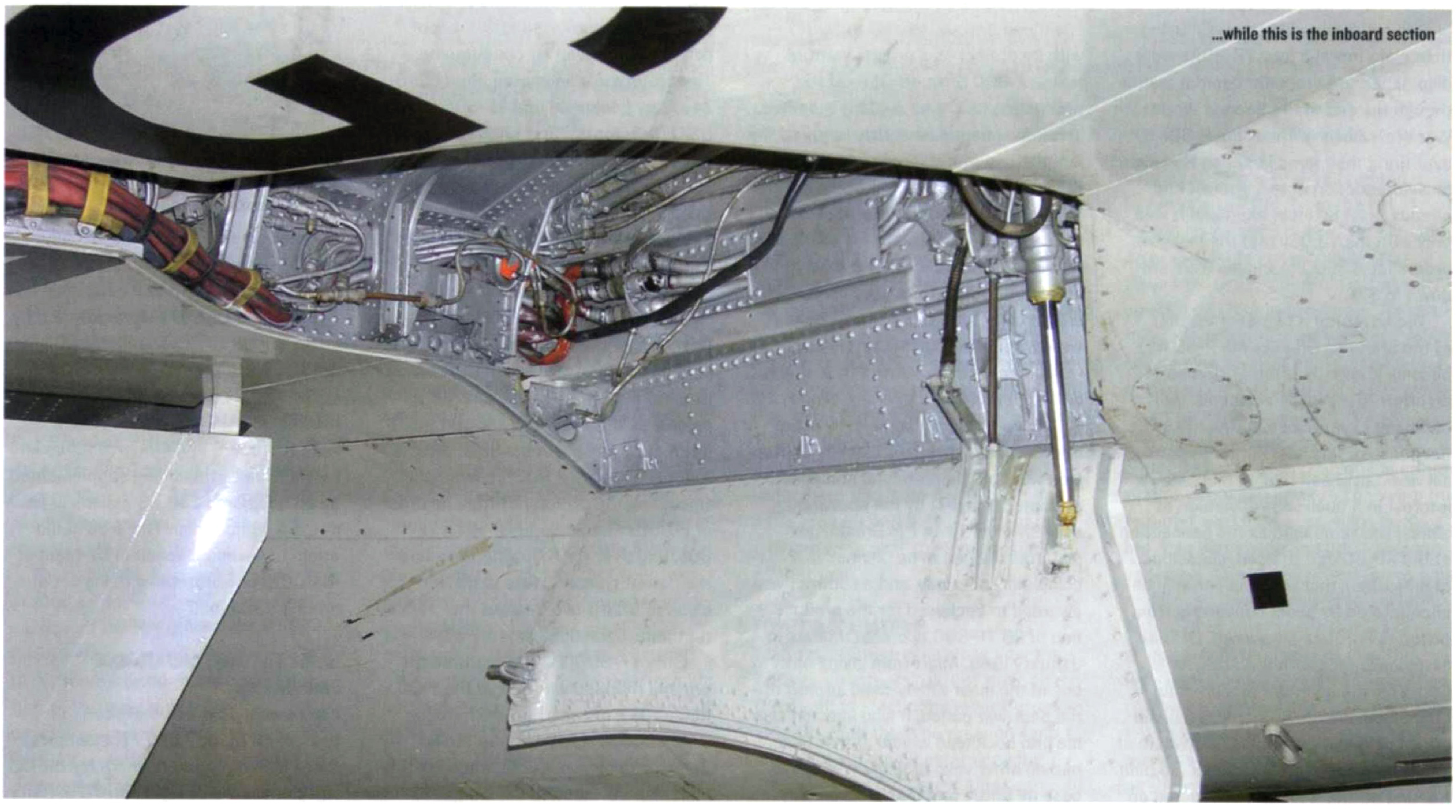
A look into the intake, showing the 'flexible' paint in this area (note warning stencil) and the wrap-around of the exterior colours

The nose leg and wheel

'Sabrinas' as they were known in the RAF, the cannon shell collectors



Looking up into the main wheel well, this is the outer section...



...while this is the inboard section

WRITTEN BY RICHARD J. CARUANA

Canada's licence-built version went through a series of designation changes. Originally known as the T-33A-N (CL-30) Silver Star Mk 3 it had its designation eventually changed to CT-33A. 133455 belongs to No. 414 Squadron
(R.J. Caruana Archives)

A Canadian-built T-33 Silver Star in its original form. Note the standard practice on this type of aircraft in having the inside halves of the wingtip tanks painted in black
(R.J. Caruana Archives)

INTERNATIONAL TWETY BIRD – THE T-33

Developed as a training version of the Lockheed P-80 Shooting Star, the T-33 was to remain in service for a considerably longer time and was to see service with a large number of nations.

America's jet age dawned on 10 June 1944 when Lockheed's XP-80A took to the air for the first time powered by a 'Whittle I-10' (Goblin) engine supplied by Britain. Within less than eight months four YP-80As were dispatched to Europe for combat testing though the end of the Second World War drew closer without the P-80s ever firing their guns in anger. However, mass production of this aircraft had already been taken in hand and it was only with the VJ Day that the massive orders for 4,3900 examples were cut down to 525.

The advent of a two-seat version of the Shooting Star' as the P-80 had become known, is often attributed to an effort to minimise accidents that had been experienced during the initial phase of this new fighter jet into service. Lockheed had, in fact, shown interest in a dual-control version at almost the same time as the conception of the XP-80 design itself, conscious of difficulties that would eventually be encountered by pilots converting from piston to jet-engined aircraft. Despite of its insistence with the Army Air Corps for the adoption of a jet-trainer officialdom dictated otherwise, considering Lockheed's proposal as a waste of much-needed fighter airframes. So pilot training at that time was conducted on T-6 Texans, followed by P-51 Mustangs and then about 25 hours in a P-80 firmly stuck on the ground!

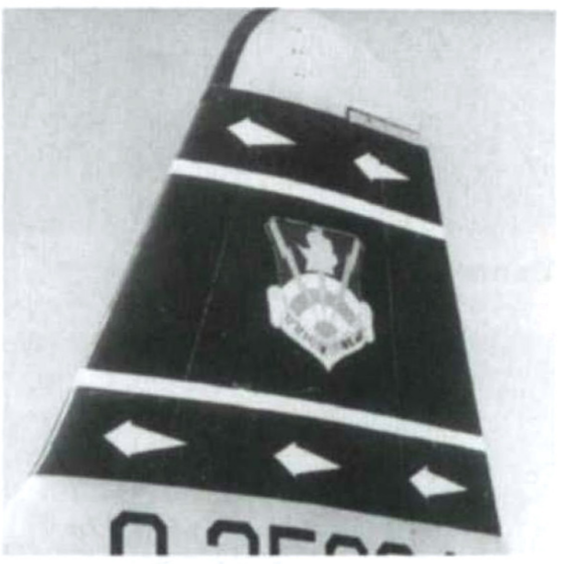
Convinced that sooner or later there would be a need for a jet trainer, Lockheed proceeded in March 1947 with its project as a private venture, taking F-80C S/No.48-356 off the production line to be suitably modified. The main change obviously required the lengthening of the forward fuselage, together with the air intakes, by 26.5in (67cm) just ahead of the wing leading edges to house a second cockpit, together with a 12in (30cm) extension behind the wings to restore the aircraft's centre of gravity. Both cockpits were fitted with flight controls and instruments, and enclosed by a single, clear 7-foot upward opening canopy.

The Air Force began to show some interest in Lockheed's project as conversion work on the prototype proceeded, prompted (maybe) by the appearance of the Meteor T Mk 7 in Britain. Jet pilot training had to be planned in a completely new way, and a contract was awarded to Lockheed for the production of 20 TF-80C two-seat trainers in January 1948. Apart from giving birth to one of the most widely-used aircraft of the post-war period, it also injected new life into Lockheed which, at that time, had no other valid project on which to base its future and that of its employees.

It had been planned to reduce the P-80's nose gun armament from six to two although, if necessary, the other four guns could also be fitted. Other changes included the fitting of a smaller fuselage fuel tank, use of nylon fuel cells and improved air conditioning. The prototype, designated Model 580-74-06 by Lockheed and TF-80C by the USAF flew for the first on 22nd March 1948 at Van Nuys (California) with Tony Le Vier at the controls. During the third flight, the canopy flew clear of the aircraft during a dive but thanks to Le Vier's skilled piloting the aircraft came back to the ground in one piece.

To further promote its belief in the two-seat jet trainer, Lockheed proceeded with a tour of USAF and USN bases in the United States. This paid off handsomely as both services showed their interest by placing substantial orders. The USAF decided that 128 examples (including the prototype) from its order of F-80Cs should be finished as TF-80s, and over the following ten years the parent company was to deliver close to 6,000 two-seaters that had, by that time, been designated T-33As.

Early TF-80C/T-33As featured the original rounded wingtips of the F-80 fighter, and also carried the latter's style of underslung wing tip tanks. Some even carried the fighter's 1,000lb bomb pylons beneath the wings.



Close-up of the 7272th Flying Training Wing from Wheelus Air Base, Libya, carried on 53-5824
(R.J. Caruana)

Fletcher type wing tip tanks became a standard feature on most of the T-33As produced after the initial batch.

Production T-33As were powered by an Allison J33-A-25 (later also J33-A-35) centrifugal-flow turbojet, rated at 5,400lb for take-off. Fuel capacity totalled 353 US gallons, housed in wing (outboard and inboard) tanks and fuselage cells, this being supplemented by an additional 230 US gallons in each of the wingtip tanks. The T-33 could attain a maximum speed of 524mph at 10,000ft, cruising speed being set at around 430mph.

NAVAL VERSIONS AND LICENCE PRODUCTION

Lockheed's production of the T-33 peaked off in 1959 at 5,771 examples, these including 699 trainers for the US Navy under the designation TO-2 (later TV-2 then T-33B). The T2V-1 (later T-1A) was a highly modified version, developed by Lockheed as its Model L-245, aimed at producing a carrier-qualified jet trainer, as the standard T-33B was considered unsuitable for such a role. Powered by an Allison J33-A-16A, the prototype flew for the first time on 15 December 1953. The first production T2V-1 named Sea Star was delivered to the Naval Air Advanced Training Command at Corpus Christi on 27 May 1957. 149 examples were built, the type being redesignated T-1A in 1962.

T-33A-1-LO, S/No.53-5824/TR-824 from the 7272th FTW of the USAF based in Libya, a frequent visitor to Luqa, Malta, during the early 1960s. Trim is in blue/white. See other photo for close up of the badge carried on the fin
(R.J. Caruana)

Last T-33s to visit Malta were those from the Belgian Air Force, including FT02, seen in June 1978
(R.J. Caruana)

By mid-1944, Lockheed had already started to design a reconnaissance version of the P-80. YP-80A S/No.44-84988 was chosen to become the XF-14 prototype through the transformation of its nose area wherein it could carry an array of photo cameras. Two P-80As were then similarly modified and redesignated FP-80As, the first of 152 examples that were to follow, later known as RF-80s. This camera nose was married to the nose of a number of T-33s, converting them into high speed two-seat reconnaissance RT-33s.

Canada was the major foreign operator to obtain a production licence of the T-33. Designated T-33A-N (CL-30) Silver Star Mk 3, the Canadair version differed from the Lockheed model in its power plant. This consisted of a Rolls-Royce Nene 10 turbojet. At first Canadair built 20 T-33As from kits supplied by Lockheed, these bearing the designation of Silver Star Mk 1. The Mk 2 consisted of another Lockheed airframe in which the Nene was experimentally fitted for trials. In all, 656 examples of this jet trainer were built in Canada, and in its final service life bore the designation of CT-133A.

Kawasaki built 210 T-33As for the Japanese Air Self Defence Force, 18 of which were completely supplied by Lockheed in knocked-down form. Most of the components for the balance of this order also came from the parent company.

Boeing took on the task of upgrading the T-33 in the 1980s by proposing a new version known as the Skyfox. Although about 70 percent of the original components were to be retained, it was to be fitted with a pair of Garrett TFE731-3A turbofans. The venture, however, fell through due to lack of orders and this is no wonder as far more modern and highly efficient jet trainers were available on the market by that time.

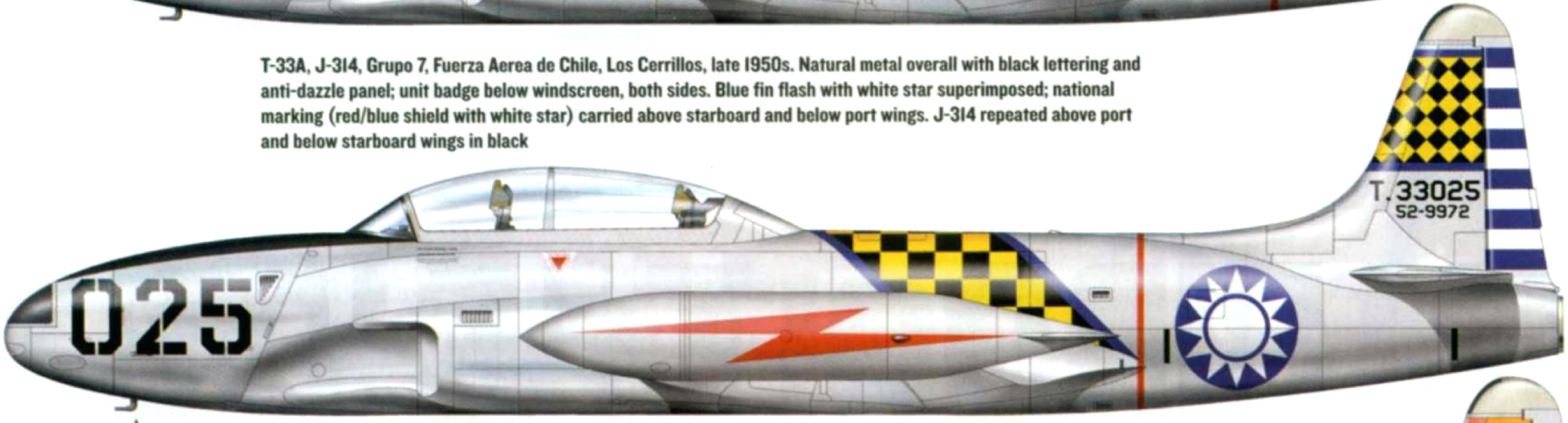
FOREIGN OPERATORS

About 40 foreign operators flew the T-33 as an integral part of their air forces, these including most European air arms, and the type enjoyed (and still enjoys to some extent) a long service life in the South American continent. One would be tempted to exclude the RAF from the list of European nations, but readers might be surprised to know that No.45 Squadron (RAF) operated a specially equipped T-33A in 1967 from Tengah for medium altitude air sampling following China's first nuclear tests (see colour pages), though full USAF markings had been retained.

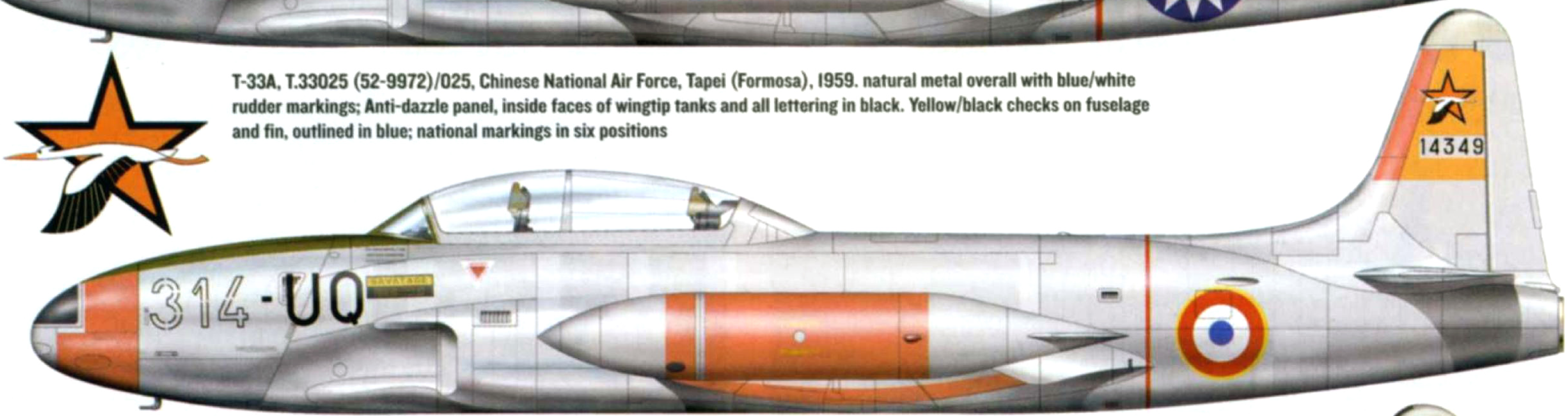
The T-33's longevity was also marked by a (literally) colourful career that not only saw the type carrying the national markings of so many nations but also such wide and varied colour schemes, sometimes linked to the type of service it was required to perform. Although in most cases this was principally in the training role, the type was also used in the interception role wherever needed. Thankfully the type still flies today, and many fine examples are to be found on the airshow circuit. ➤

CT-133A, 133572/572, No. 434 Squadron, Canadian Air Force. I-GP-12c:501-322 Grey (FS.36237) overall with all markings in FS.16175. Unit badge in white on a mid-blue band, outlined in white

T-33A, J-314, Grupo 7, Fuerza Aerea de Chile, Los Cerrillos, late 1950s. Natural metal overall with black lettering and anti-dazzle panel; unit badge below windscreen, both sides. Blue fin flash with white star superimposed; national marking (red/blue shield with white star) carried above starboard and below port wings. J-314 repeated above port and below starboard wings in black



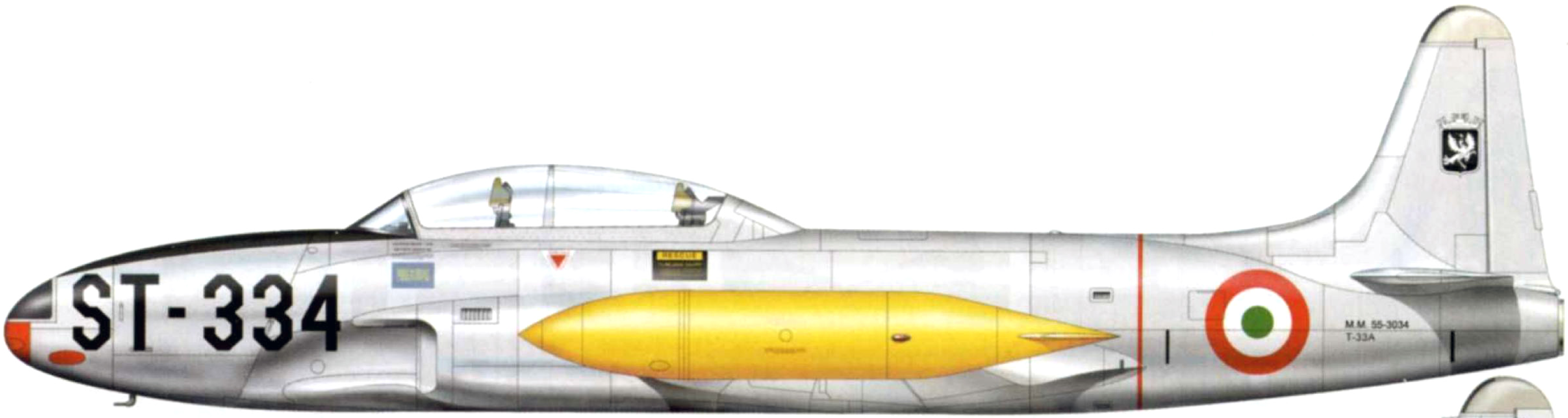
T-33A, T.33025 (52-9972)/025, Chinese National Air Force, Tapei (Formosa), 1959. natural metal overall with blue/white rudder markings; Anti-dazzle panel, inside faces of wingtip tanks and all lettering in black. Yellow/black checks on fuselage and fin, outlined in blue; national markings in six positions



T-33A, 14349/314-UQ, 314 Groupement Ecole, Armèe de l'Air. Natural metal overall with orange areas to nose and fin; orange bands chordwise around wings and central area of wingtip tanks. Lettering in black; unit badge on fin. National markings in six positions

T-33A, 29955/TR-955, No. 115 Pterix, Hellenic Air Force, 1998. Orange upper surfaces with white undersides; black lettering and anti-dazzle panel. National markings in six positions

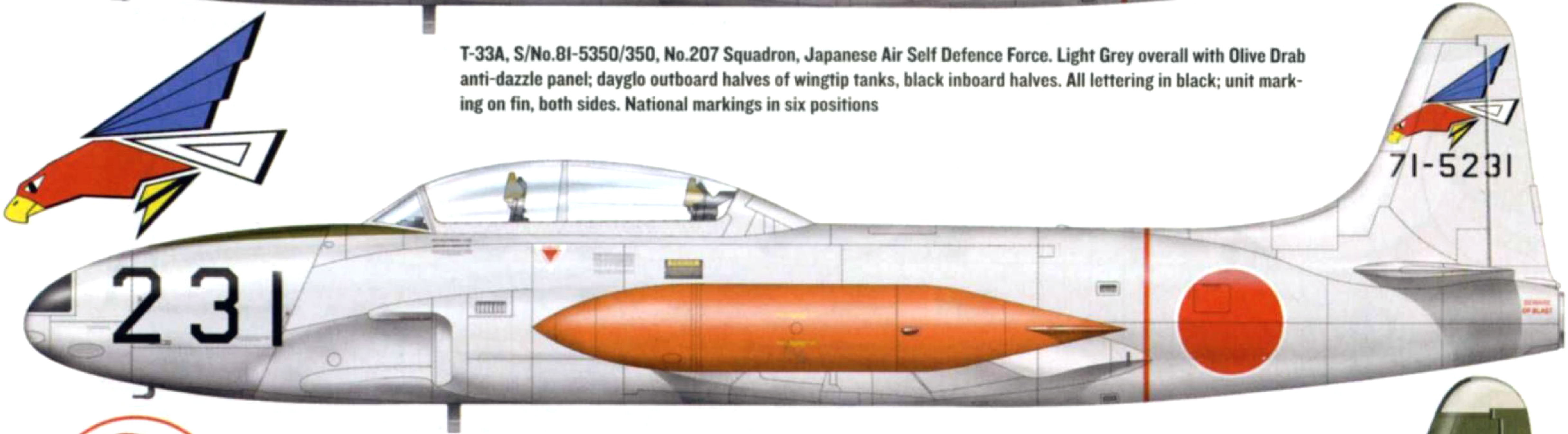
T-33A, 53077/6-99, 6˚ Aerobrigata, Aeronautica Militare Italiana. Natural metal overall with black anti-dazzle panel and lettering; red outer halves of wingtip tanks and tail unit. Inner halves of wingtip tanks in black; unit badge on fin



T-33A, MM.55-3034/ST-334, Scuola Aviogetti Amendola, Aeronautica Militare Italiana, 1960. Natural metal overall with black anti-dazzle panel and lettering; red nose tip and yellow outer faces of wingtips. Amendola flying school badge on fin (not handed on starboard side; light blue panel below cockpit carries pilots' names in yellow

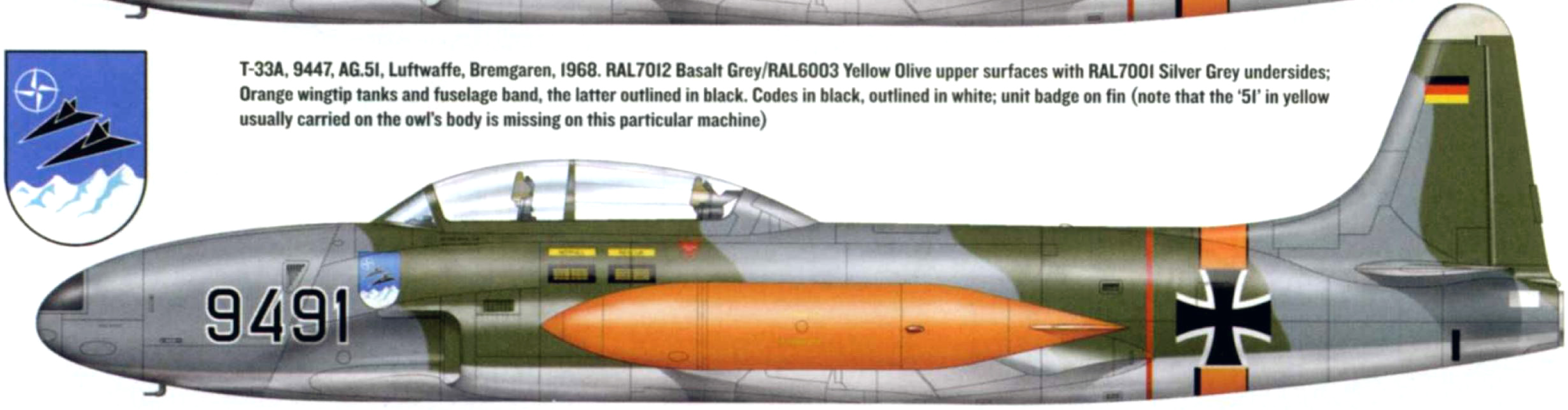
RT-33A, 35238/51-78, 651^ Squadriglia Collegamento e Bersagli, 51º Stormo, Aeronautica Militare Italiana, Istrana. Orange upper surfaces with undersides in yellow/black target tug bands; inner face of wingtip tanks and anti-dazzle panel in black. Natural metal top half of fin/rudder, and opening part of canopy frame; all lettering in black. Stormo badge on fin

T-33A, S/No.81-5350/350, No.207 Squadron, Japanese Air Self Defence Force. Light Grey overall with Olive Drab anti-dazzle panel; dayglo outboard halves of wingtip tanks, black inboard halves. All lettering in black; unit marking on fin, both sides. National markings in six positions



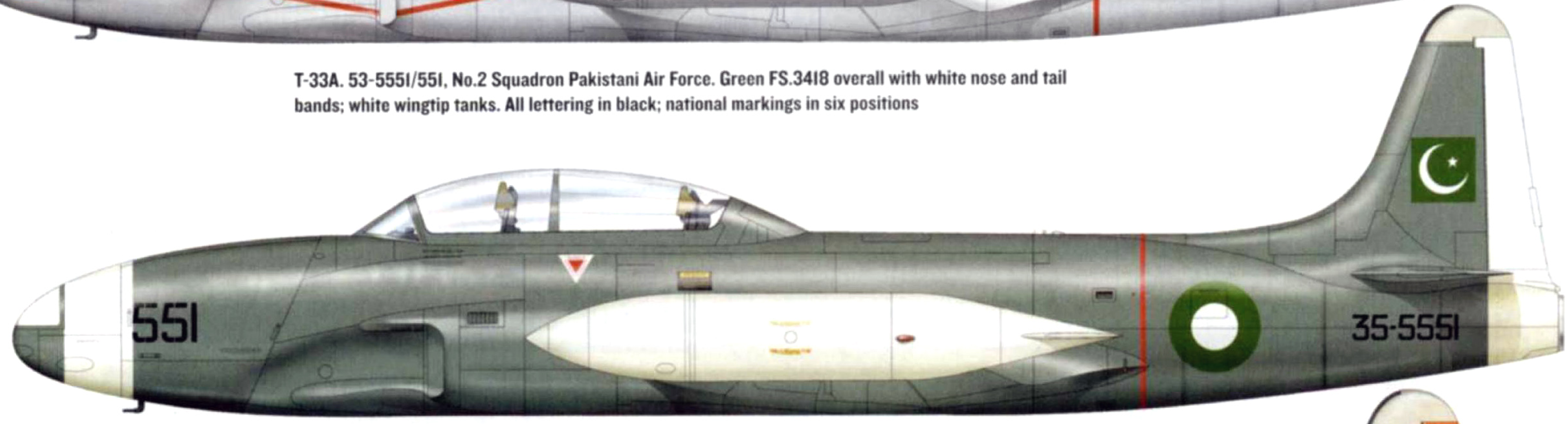
T-33A, S/No.71-5231/231, No.302 Squadron, Japanese Air Self Defence Force. Aluminium overall with Olive Drab anti-dazzle panel; black lettering. Dayglo outer faces of tip tanks, inner halves in black; unit badge on fin, both sides. National markings in six positions

T-33A, 9447, AG.51, Luftwaffe, Bremgaren, 1968. RAL7012 Basalt Grey/RAL6003 Yellow Olive upper surfaces with RAL7001 Silver Grey undersides; Orange wingtip tanks and fuselage band, the latter outlined in black. Codes in black, outlined in white; unit badge on fin (note that the '51' in yellow usually carried on the owl's body is missing on this particular machine)



T-33A, 9491, JG34, Luftwaffe, 1975. RAL7012 Basalt Grey/RAL6003 Yellow Olive upper surfaces with RAL7001 Silver Grey undersides; Orange wingtip tanks and fuselage band, the latter outlined in black. Codes in black, outlined in white; unit badge below windscreen

T-33A, 303, Fuerza Aérea de la Guardia Nacional, Nicaragua. Light grey overall with Olive Drab anti-dazzle panel; red/blue/white tail markings

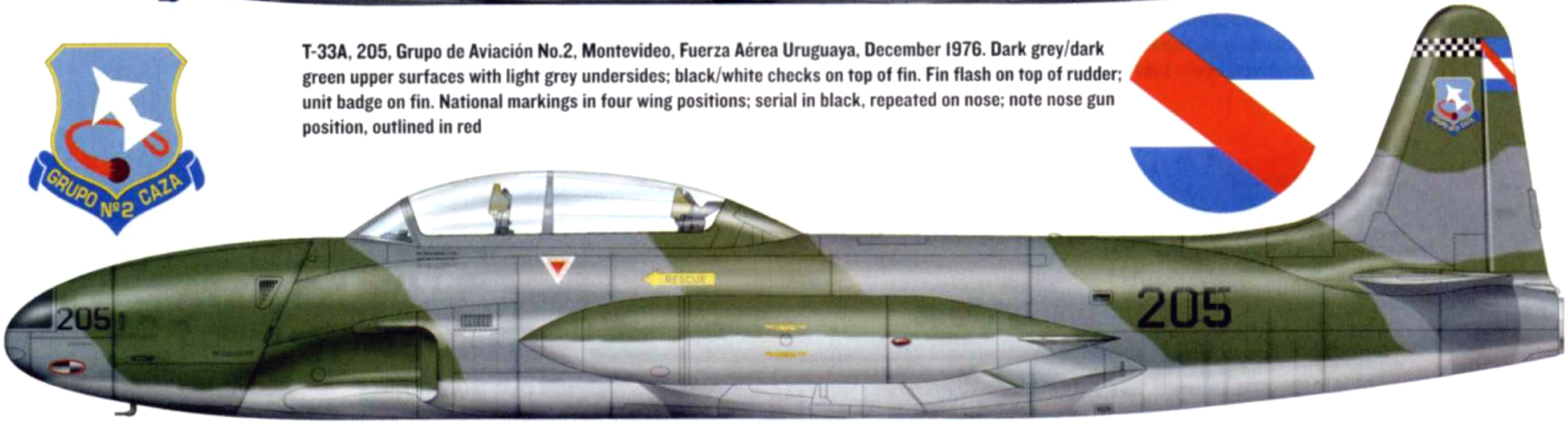


T-33A. 53-5551/551, No.2 Squadron Pakistani Air Force. Green FS.3418 overall with white nose and tail bands; white wingtip tanks. All lettering in black; national markings in six positions

T-33A, 1920/20, BA I, Força Aèrea Portuguesa, June 1971. Light grey overall with dayglo red nose, tail, airbrakes, kinked section of wing leading edges and outer half of wingtip tanks; inboard half of tanks in black. All lettering in black; national marking carried on fuselage sides, above port and below starboard wings; '1920' carried above starboard and below port wings

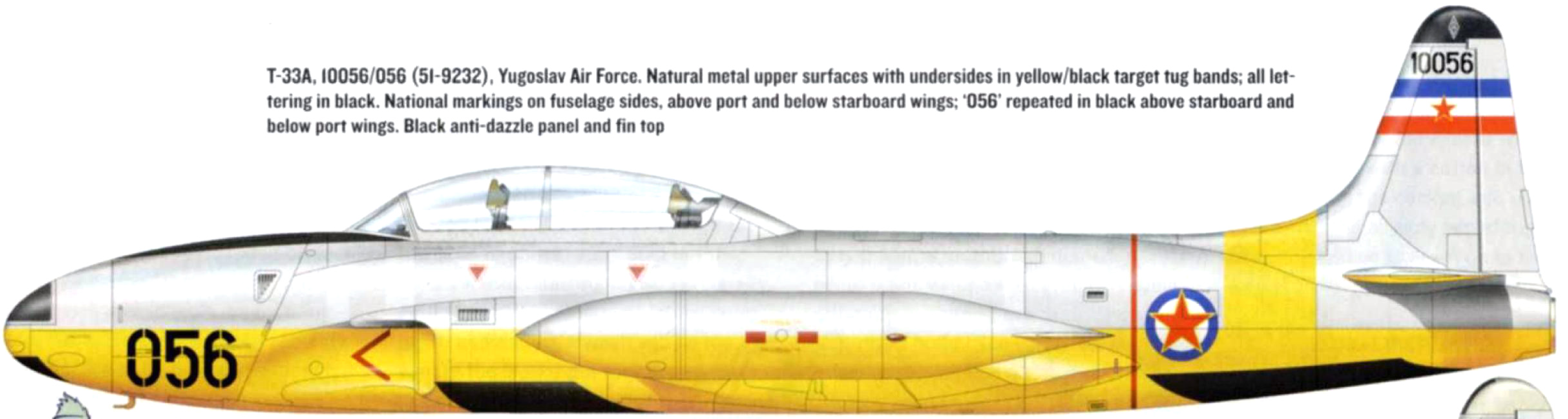
T-33A, E.15-51/41-8, Grupo 41, Zaragoza, 1982. Natural metal overall with black anti-dazzle panel, rudder cross and all lettering; unit badge on rear fuselage. National markings in six positions

T-33A, 56132/25-13, No.561 Squadron, 56th Wing, Royal Thai Air Force, 1983. Natural metal overall with blue trim to nose and wingtip tanks; yellow/black checks on fin/rudder. Lettering in black; Olive Drab anti-dazzle panel

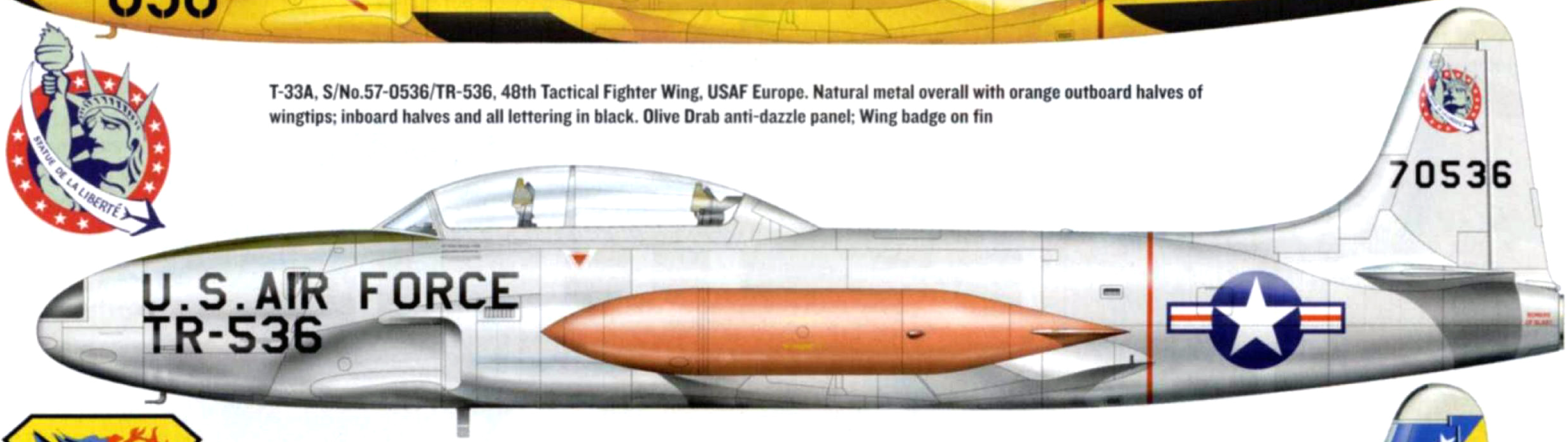


T-33A, 205, Grupo de Aviación No.2, Montevideo, Fuerza Aérea Uruguaya, December 1976. Dark grey/dark green upper surfaces with light grey undersides; black/white checks on top of fin. Fin flash on top of rudder; unit badge on fin. National markings in four wing positions; serial in black, repeated on nose; note nose gun position, outlined in red

T-33A, 10056/056 (51-9232), Yugoslav Air Force. Natural metal upper surfaces with undersides in yellow/black target tug bands; all lettering in black. National markings on fuselage sides, above port and below starboard wings; '056' repeated in black above starboard and below port wings. Black anti-dazzle panel and fin top



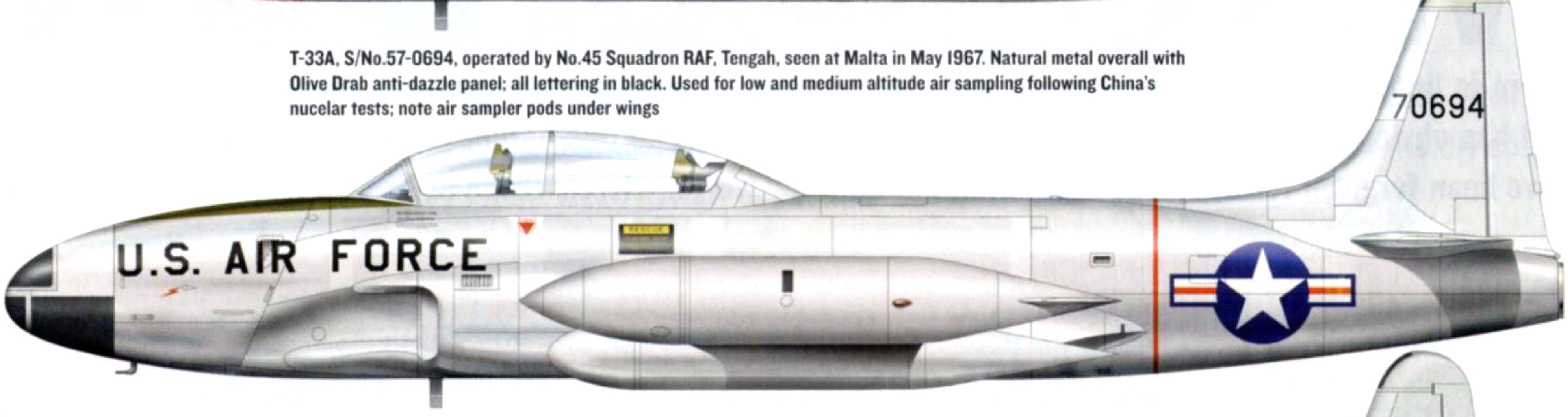
T-33A, S/No.57-0536/TR-536, 48th Tactical Fighter Wing, USAF Europe. Natural metal overall with orange outboard halves of wingtips; inboard halves and all lettering in black. Olive Drab anti-dazzle panel; Wing badge on fin



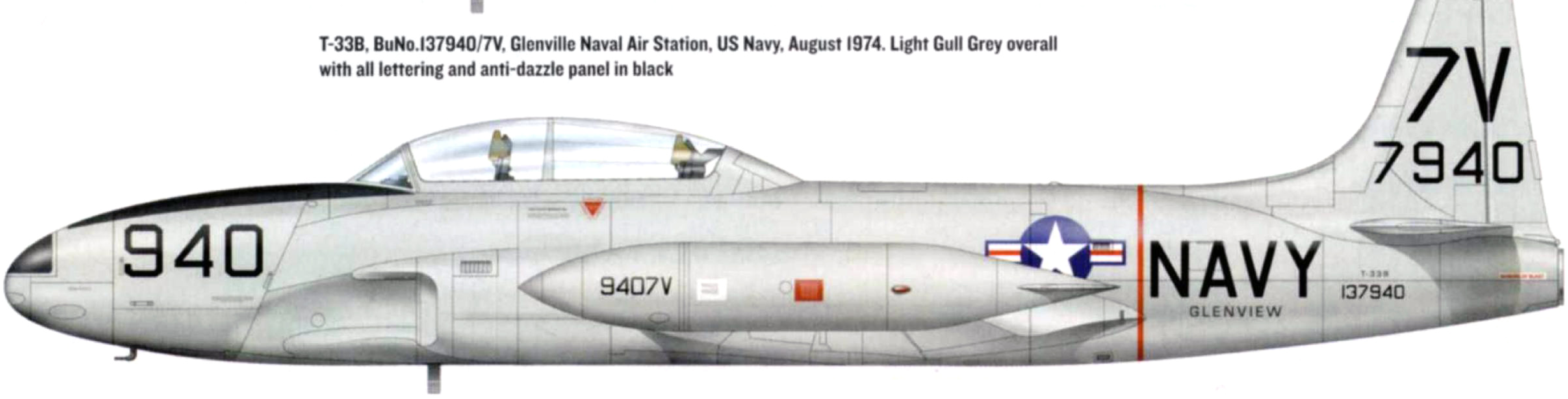
T-33A, S/No.53-5137/TR-137, 81st Tactical Fighter Wing, USAF Europe. Natural metal overall with Olive Drab anti-dazzle panel; red air intakes. Black lettering; Outstanding Unit Award below windscreen. Wing badge on fuselage sides

T-33A, S/No.56-1782, Air Force Communications Agency/AFCS, United States Air Force, August 1970. Light grey overall with lower nose, tail unit and flash on fuselage in Arctic Red, outlined in black; Arctic Red wingtip tanks with black tip. Black anti-dazzle panel and all lettering, except 'AFCS' which is white on black; US national markings on fuselage sides, above port and below starboard wings

T-33A, S/No.57-0694, operated by No.45 Squadron RAF, Tengah, seen at Malta in May 1967. Natural metal overall with Olive Drab anti-dazzle panel; all lettering in black. Used for low and medium altitude air sampling following China's nucelar tests; note air sampler pods under wings



T-33B, BuNo.137940/7V, Glenville Naval Air Station, US Navy, August 1974. Light Gull Grey overall with all lettering and anti-dazzle panel in black



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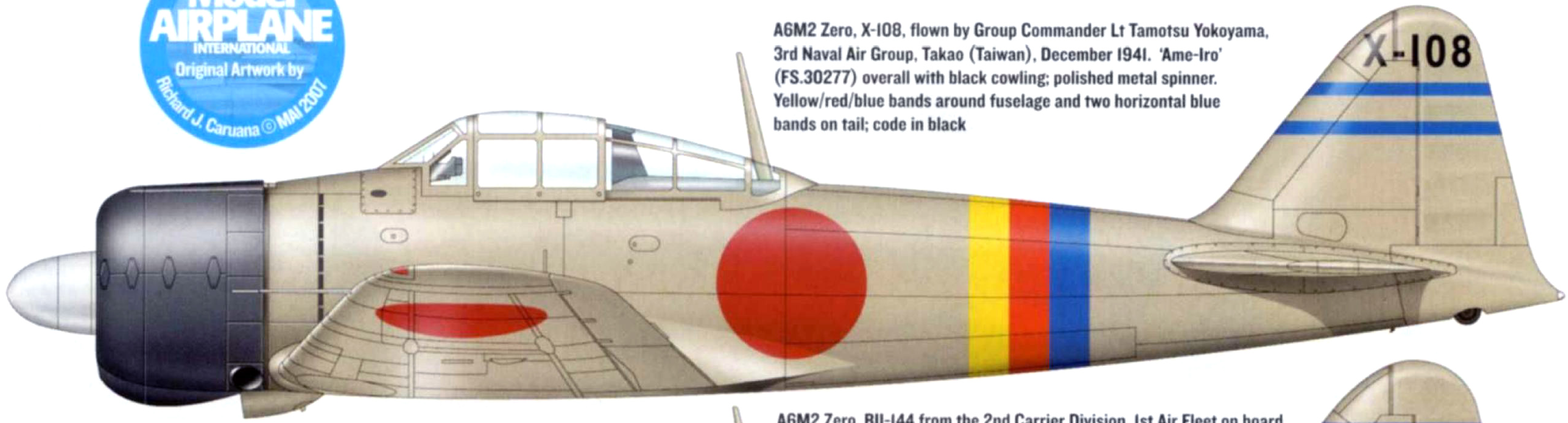
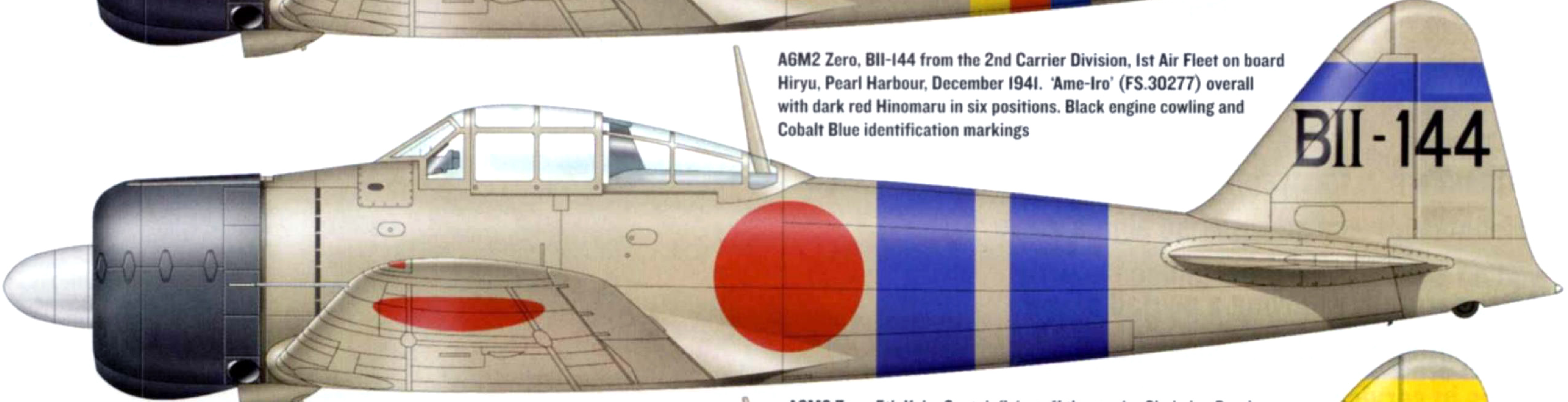
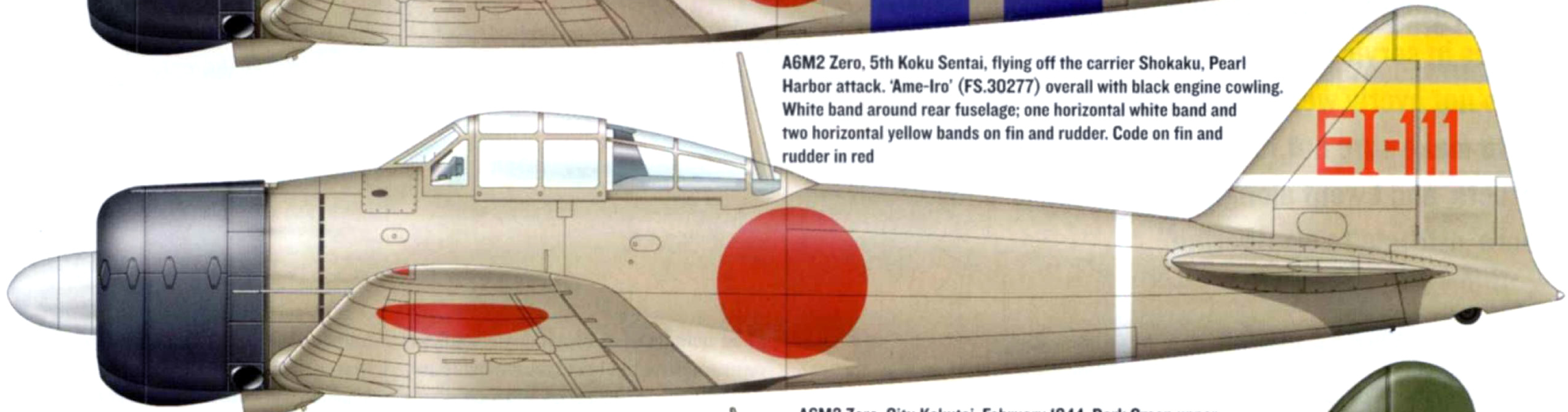


A6M2 Zero, X-108, flown by Group Commander Lt Tamotsu Yokoyama, 3rd Naval Air Group, Takao (Taiwan), December 1941. 'Ame-Iro' (FS.30277) overall with black cowling; polished metal spinner. Yellow/red/blue bands around fuselage and two horizontal blue bands on tail; code in black

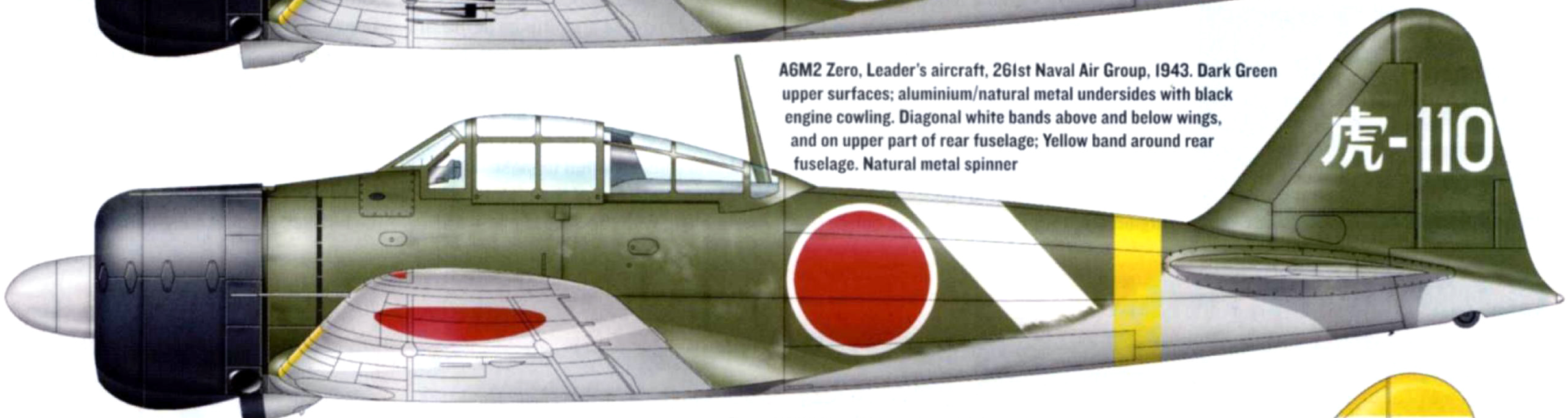


A6M2 Zero, BII-144 from the 2nd Carrier Division, 1st Air Fleet on board Hiryu, Pearl Harbour, December 1941. 'Ame-Iro' (FS.30277) overall with dark red Hinomaru in six positions. Black engine cowling and Cobalt Blue identification markings

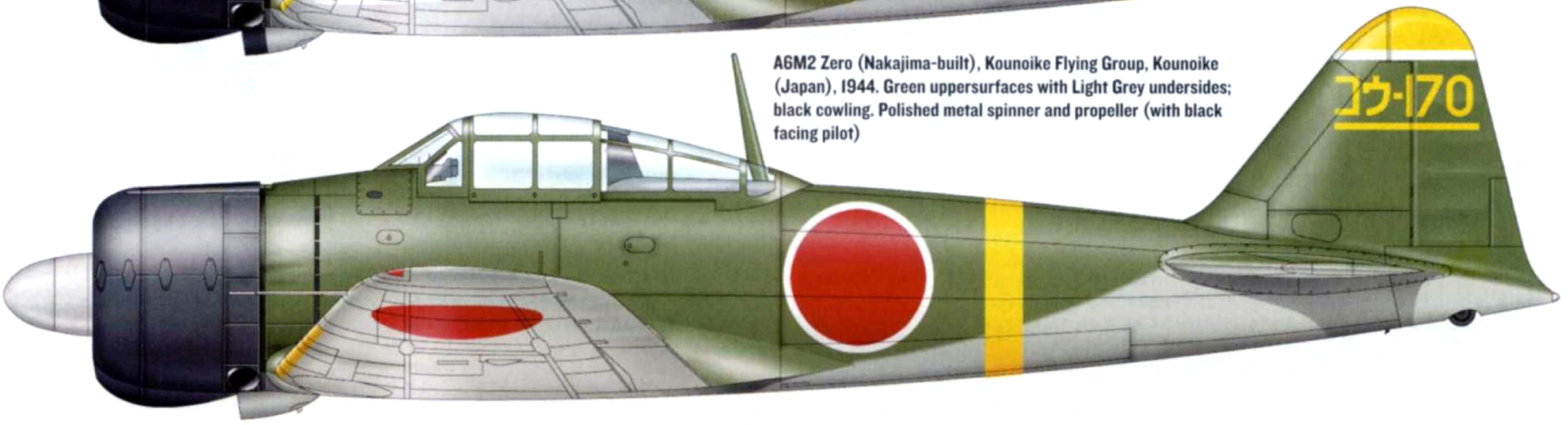


A6M2 Zero, 5th Koku Sentai, flying off the carrier Shokaku, Pearl Harbor attack. 'Ame-Iro' (FS.30277) overall with black engine cowling. White band around rear fuselage; one horizontal white band and two horizontal yellow bands on fin and rudder. Code on fin and rudder in red

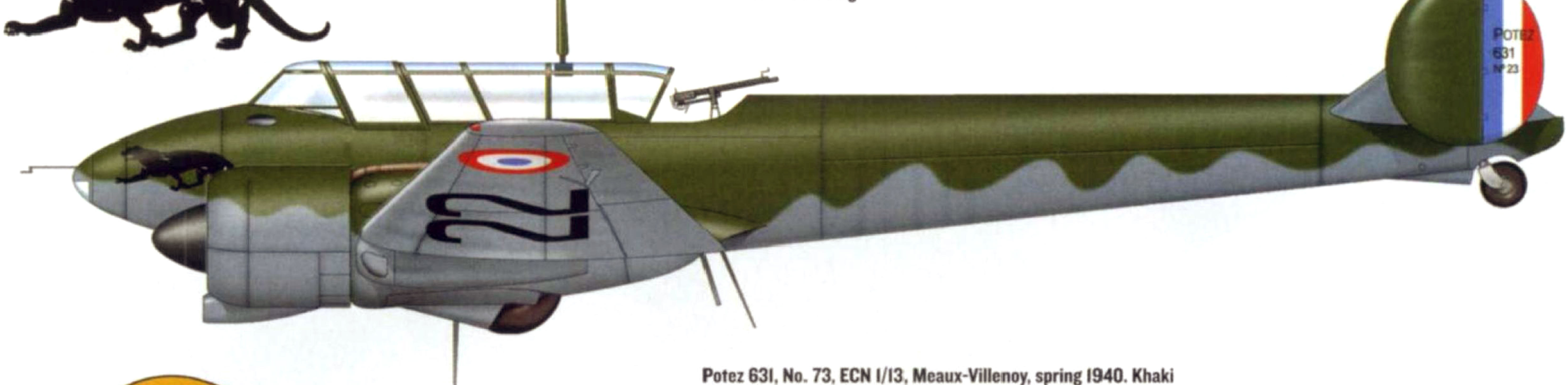
A6M2 Zero, Oitu Kokutai, February 1944. Dark Green upper surfaces; aluminium/natural metal undersides. Black engine cowling and yellow wing leading edge stripes. Yellow code, with '147' repeated underneath the wings in black; spinner natural metal



A6M2 Zero, Leader's aircraft, 261st Naval Air Group, 1943. Dark Green upper surfaces; aluminium/natural metal undersides with black engine cowling. Diagonal white bands above and below wings, and on upper part of rear fuselage; Yellow band around rear fuselage. Natural metal spinner

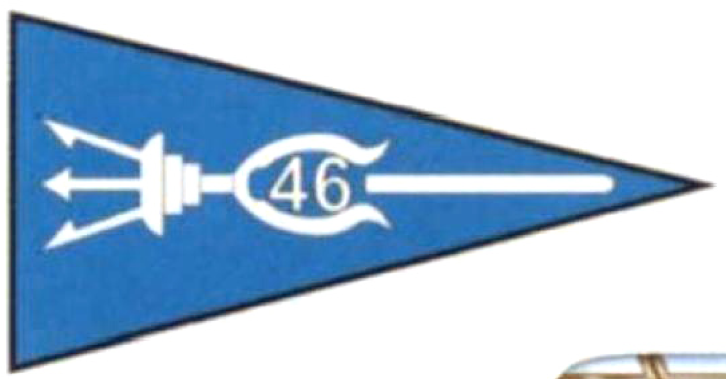


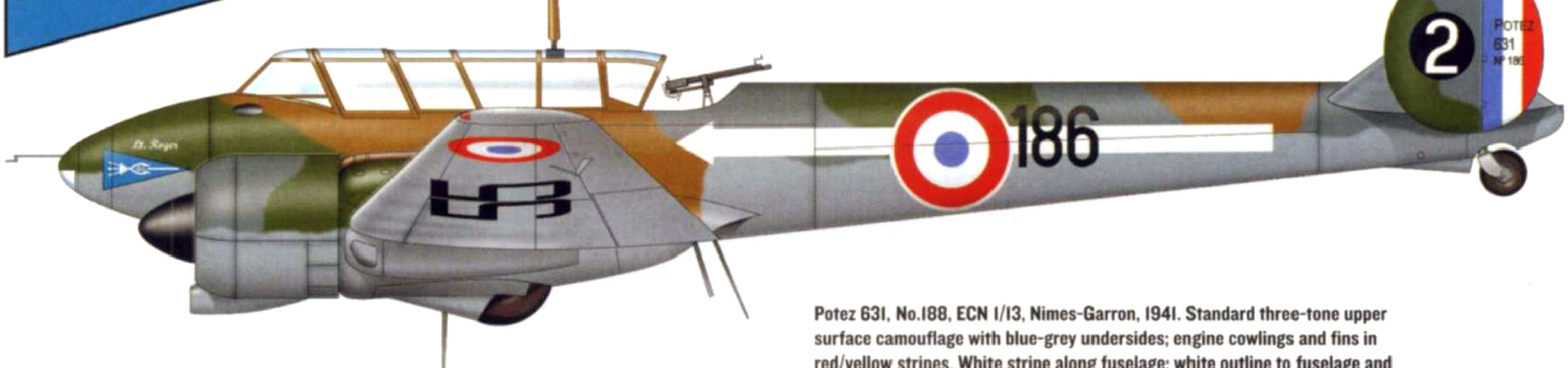
A6M2 Zero (Nakajima-built), Kounoike Flying Group, Kounoike (Japan), 1944. Green uppersurfaces with Light Grey undersides; black cowling. Polished metal spinner and propeller (with black facing pilot)



Potez 631, No. 23, 2e Escadrille, GC.II/7, Luxeuil, Late 1939. Khaki Green upper surfaces with blue/grey undersides; lettering in black. Roundels in four wing positions; '22' in black below wings. Black spinner; unit badge on forward fuselage

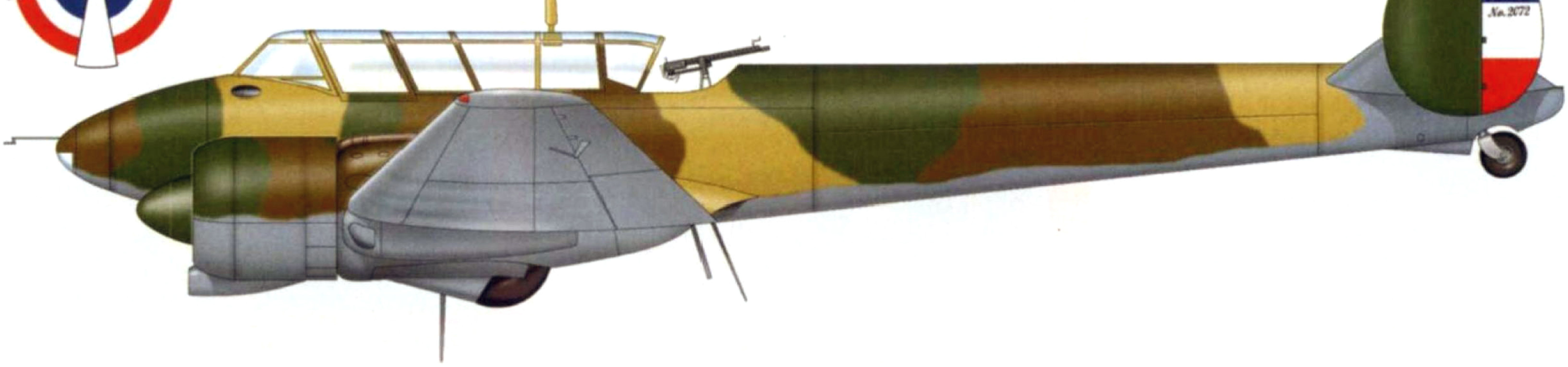
Potez 631, No. 73, ECN 1/13, Meaux-Villenoy, spring 1940. Khaki Green/Dark Brown/Medium Grey upper surfaces with blue-grey undersides; roundels in six positions. Spinners and '44' below wings in black; unit badge on nose. White '8' on a black disk on inside face of fins





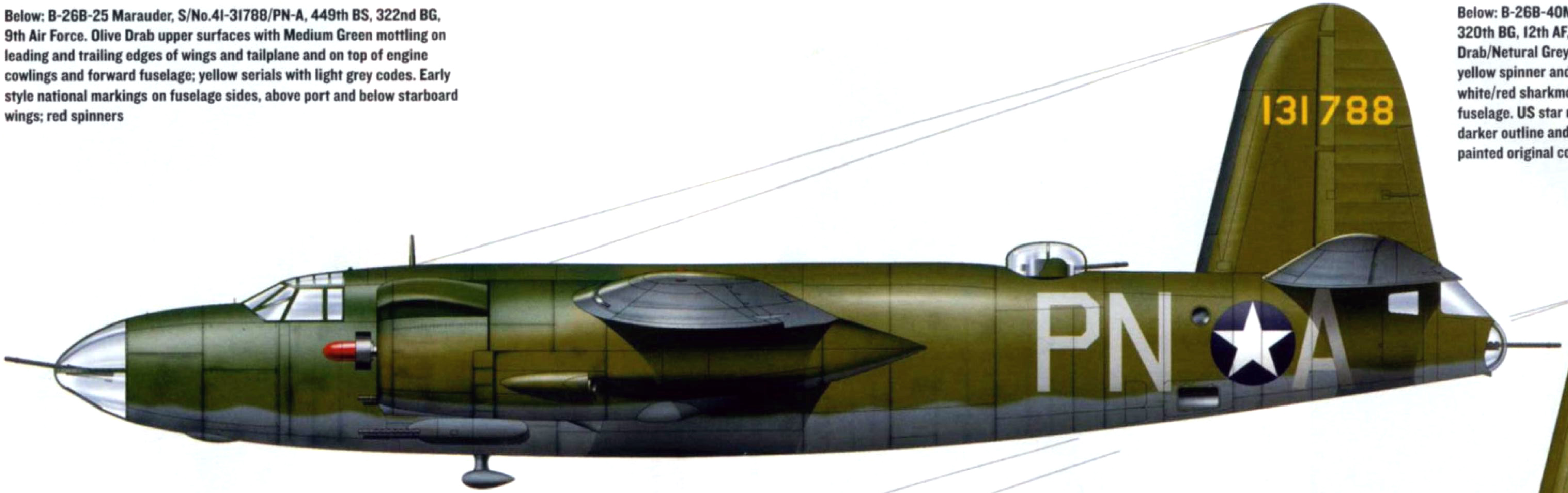
Potez 631, No.186, ECN 4/13, Nimes-Courbessac, summer 1940. Standard three-tone camouflage upper surfaces with blue-grey undersides; black spinners, '55' below wings and '186' on fuselage sides. White arrow along fuselage; white '2' in a black disk on fins. Badge of C.46 on nose

Potez 631, No.188, ECN 1/13, Nimes-Garron, 1941. Standard three-tone upper surface camouflage with blue-grey undersides; engine cowlings and fins in red/yellow stripes. White stripe along fuselage; white outline to fuselage and roundels above wings. White '7' on fin; black spinners and '57' below wings. Unit marking on nose

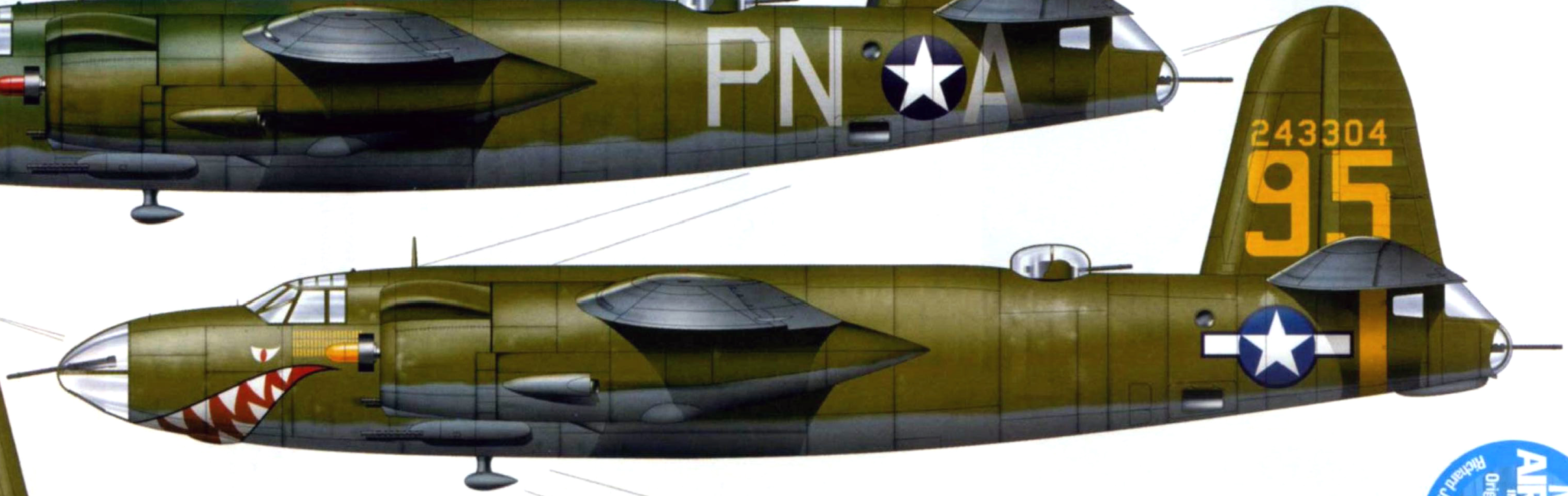


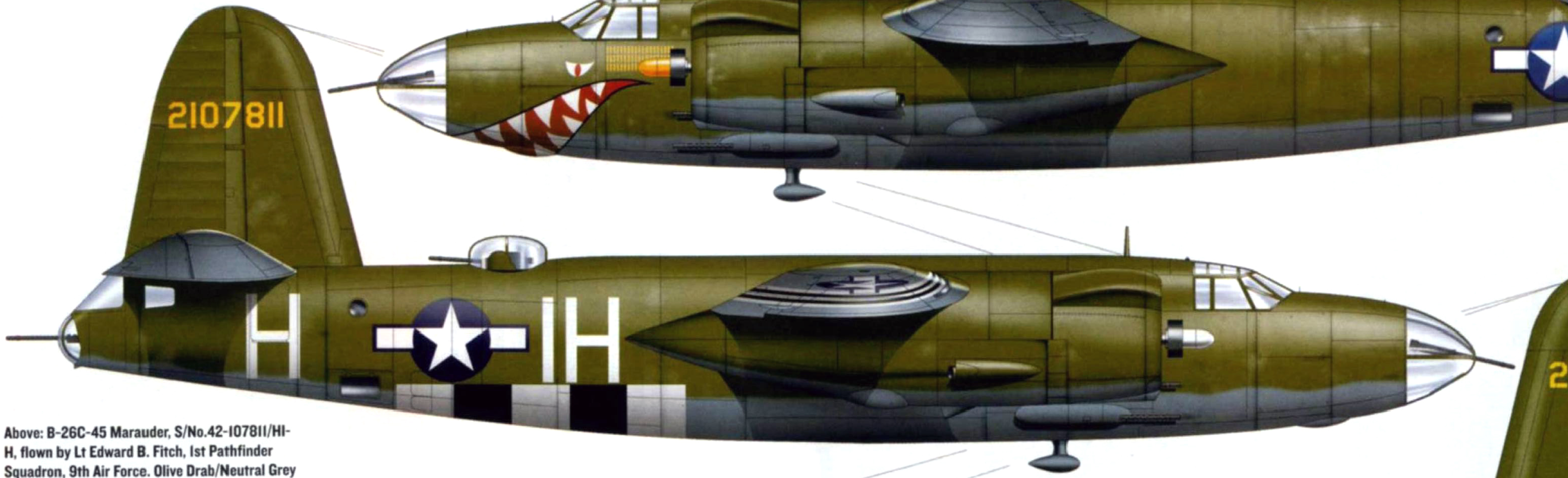
Potez 631 C3, No.2072, Yugoslav Air Force, captured by the Germans and scrapped in April 1941. Sand/brown/dark green upper surfaces with light blue grey undersides; national markings above port wing and below starboard wing only

Below: B-26B-25 Marauder, S/No.41-31788/PN-A, 449th BS, 322nd BG, 9th Air Force. Olive Drab upper surfaces with Medium Green mottling on leading and trailing edges of wings and tailplane and on top of engine cowlings and forward fuselage; yellow serials with light grey codes. Early style national markings on fuselage sides, above port and below starboard wings; red spinners

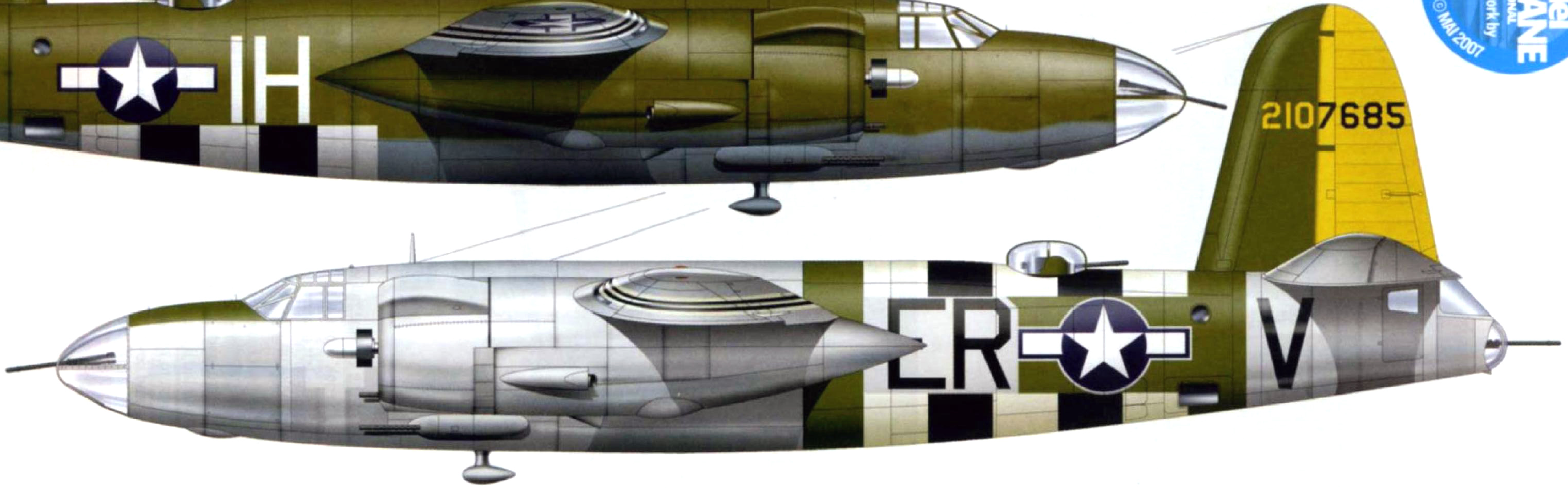


Below: B-26B-40MA, S/No.42-43304/95, 444th BS, 320th BG, 12th AF, Decimomannu (Sardinia), 1944. Olive Drab/Netural Grey finish with yellow serials and codes; yellow spinner and mission markings on nose. Black/white/red sharkmouth motif; yellow band around rear fuselage. US star markings in light colours with repainted darker outline and bars in standard positions; note over-painted original code letter 'L' on fuselage





Above: B-26C-45 Marauder, S/No.42-107811/HI-H, flown by Lt Edward B. Fitch, 1st Pathfinder Squadron, 9th Air Force. Olive Drab/Neutral Grey finish with white codes and yellow serials; black/white bands around wings and below rear fuselage. National markings in standard positions



Right: B-26C-45 Marauder, S/No.42-107685/ER-V, 451st BS, 322nd BG, 9th Air Force, Great Saling, June 1944. Natural metal overall with Olive Drab rear fuselage section, fin and anti-dazzle panels (ahead of cockpit and inside faces of engine col-wings); codes in black. White/black stripes around rear fuselage and wings; national markings in standard positions. Yellow rudder and serial on fin; black serial on rudder

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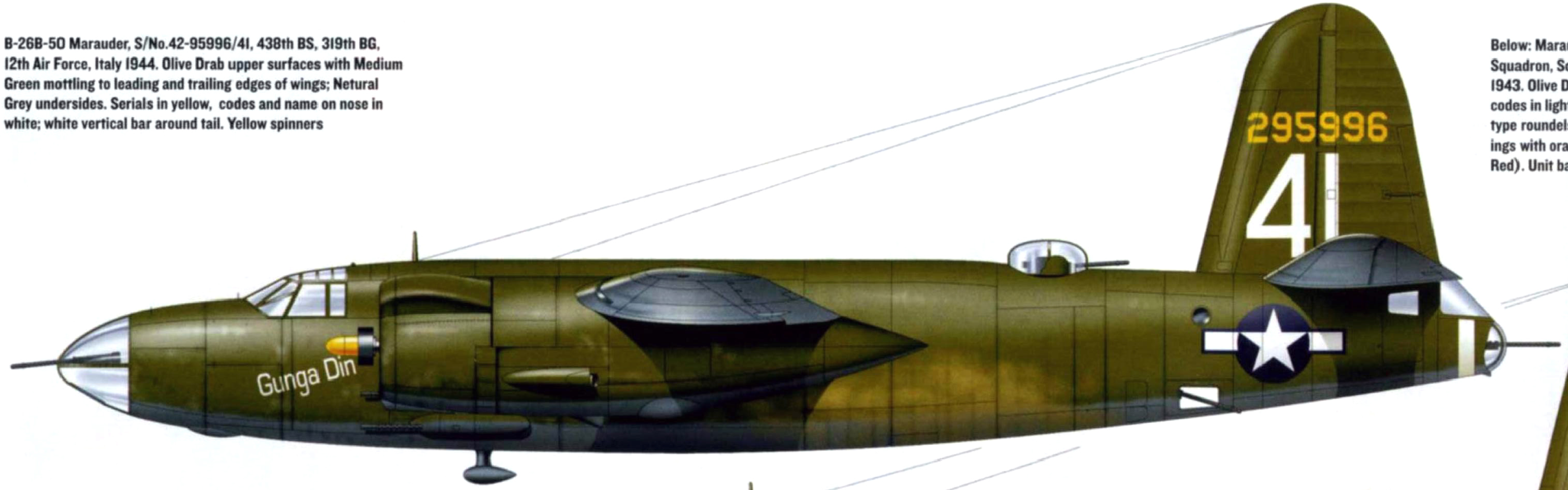
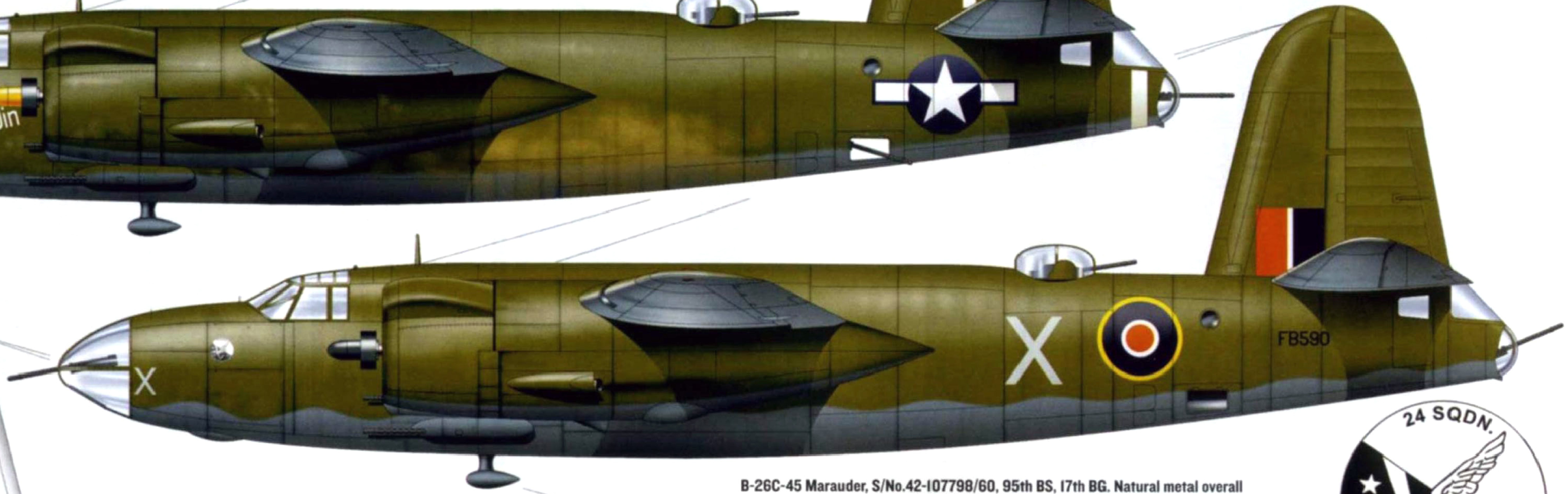
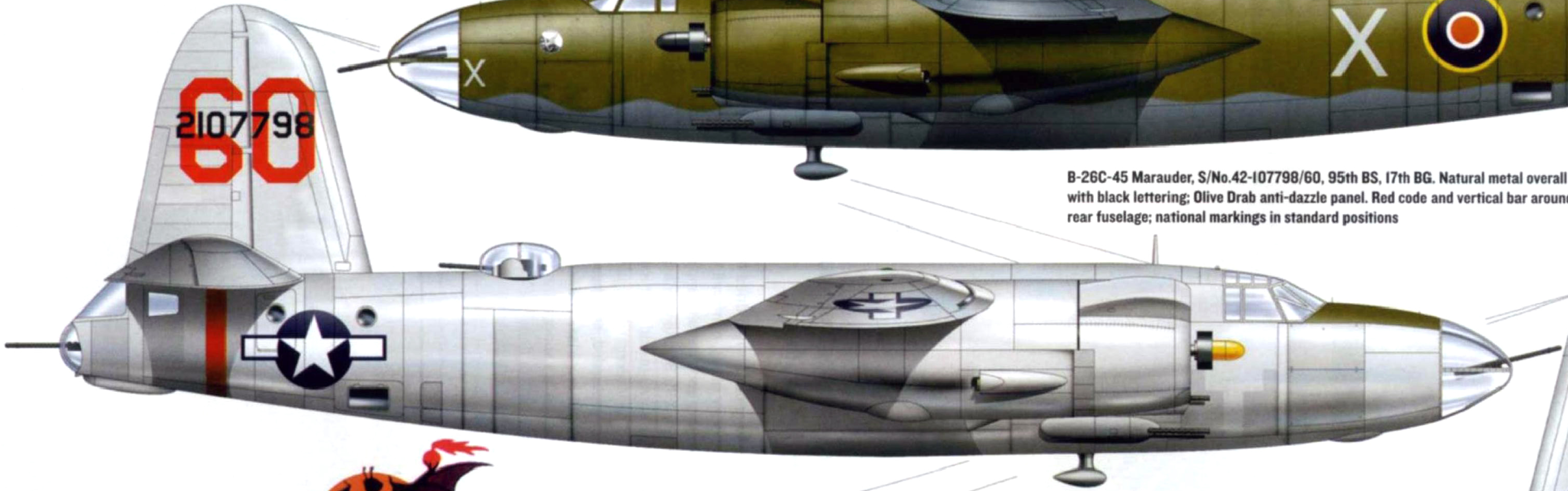
B-26B-50 Marauder, S/No.42-95996/41, 438th BS, 319th BG, 12th Air Force, Italy 1944. Olive Drab upper surfaces with Medium Green mottling to leading and trailing edges of wings; Netural Grey undersides. Serials in yellow, codes and name on nose in white; white vertical bar around tail. Yellow spinners



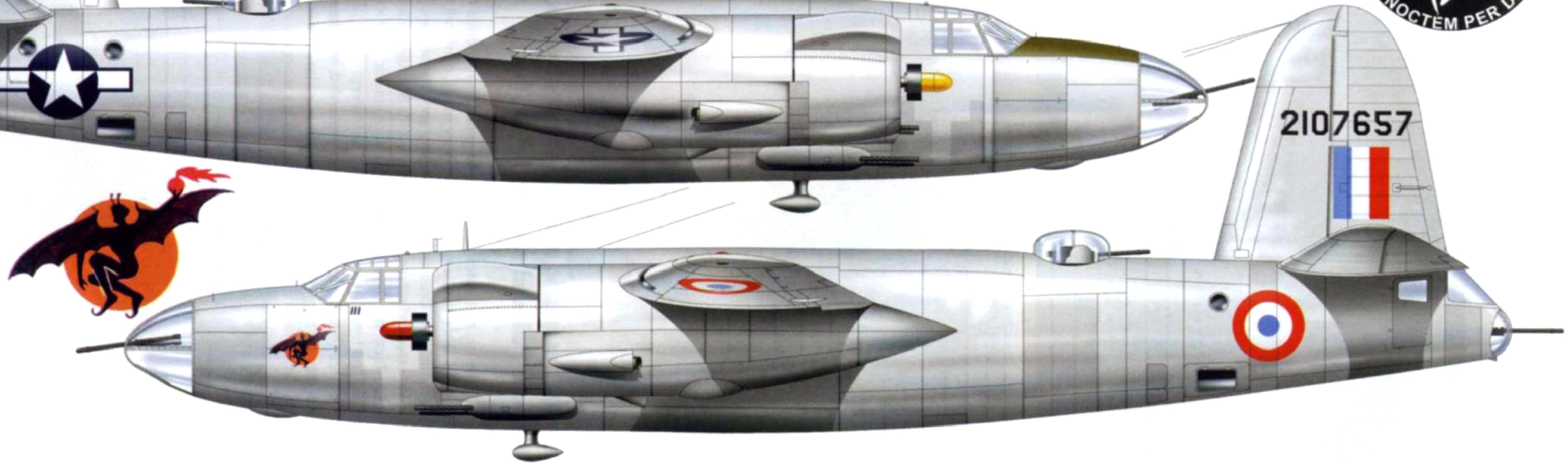
Below: Marauder Mk II, FB590/X, No.24 Squadron, South African Air Force, Italy, 1943. Olive Drab/Neutral Grey finish with codes in light grey and serial in black; 'B' type roundels above wings (RAF style markings with orange centre in place of Ident Red). Unit badge on nose



B-26C-45 Marauder, S/No.42-107798/60, 95th BS, 17th BG. Natural metal overall with black lettering; Olive Drab anti-dazzle panel. Red code and vertical bar around rear fuselage; national markings in standard positions



B-26C-45 Maurauder, S/No. 42-107657, Groupe de Bombardament I/22, operating within the 1st TAF, Italy, lae 1944. Natural metal overall with black serials; roundels in six positions. Unit badge on nose; note three mission markings and only one side gun pack per side



WRITTEN BY RICHARD J. CARUANA FROM MALTA

LAST OF THE CURTISS HAWKS

Following its humiliating baptism of fire with the USAAC, when more than half of those stationed in Hawaii were destroyed at Pearl Harbor, the P-40 rose from the ashes to become one of the most important weapons in the Allied arsenals during WWII

Developed from the Hawk 75 the P-40 represented a major leap forward, bringing fighter design across the Atlantic to a level on a par with that of European manufacturers and siring a series of excellent fighting machines built in considerable numbers. Although the Hawk 75 was considered obsolete by the time of the Pearl Harbor attack of December 1941, it was to see a reasonably successful fighting career with the French, both on the Western Front and, later, with the Vichy Air Force. Known in US service as the P-36A, it had by that time been relegated to secondary roles. With the availability of the Allison liquid-cooled in-line engine in 1937, the Curtiss Aeroplane Division (Curtiss-Wright) embarked on its experimental installation in place of the Pratt & Whitney R-1830-13 radial that powered the P-36. Work on the tenth P-36A off the production line began in March 1938 under the direction of Chief Engineer Donovan R. Berlin. Curtiss received a firm order from the United States Army Air Corps (USAAC) on 30th July 1938, involving the installation of the Allison V-1710-19 (C-13), rated at 1,160hp for takeoff, under the designation XP-40.

Apart from the new engine cowling and its related cooling system, the XP-40 was practically identical to the Hawk 75. Even the armament installation remained the same, consisting of one 0.50in (12.7mm) and one 0.30in (7.62mm) machine gun above the engine. This enabled work to proceed rapidly at the Buffalo (New York) factory and the first flight took place on 14th October 1938. The prototype only managed a top speed of 299mph (481km/h) compared to the 350mph (562km/h) that the design team had estimated. Through the simple modification of moving the belly radiator to below the engine cowling maximum speed rose to 342mph (550km/h). Trials at Wright Field were carried out between the Lockheed XP-38, Bell XP-39, and Curtiss XP-40, all representing fighters that were to attain large scale production even though it was the Curtiss design that was declared outright winner in January 1939. A contract for 524 P-40s was received on 27th April 1939, followed by a series of modifications to bring about overall improvement, with first examples leaving the production line in May of the following year. Apart from these aircraft, officially bearing designations P-40A, P-40B and P-40C, Curtiss supplied a further 1,180 examples to the Royal Air Force (RAF) under the designations Tomahawk Mk I, Ia, Ib, IIa and IIb. Other users included the Royal Egyptian Air Force, the Turkish Air Force, and the Soviet Union.

Skull-decorated noses immediately identify these P-40Ns as belonging to the 85th Fighter Squadron seen here at Nagahuli airfield, in India, in May 1944 (R.J. Caruana Archives)

A THIRD GENERATION

By the spring of 1941, production of the 'second generation' Curtiss Hawks had come to an end as the P-40D appeared, powered by the new 1,150hp Allison V-1710-39 Model F engine. This new powerplant was tested on a completely new aircraft, the XP-46A of which two prototypes were ordered on 29th September 1939. Rather than waste precious time and resources on a completely new fighter, the USAAC decided to drop the XP-46A in favour of a similarly-powered version of the P-40, especially as the new experimental fighter, which flew for the first time on 15th February 1941, had performed well below expectations. Even before the first P-40D had been completed, the RAF had placed an order of 560 examples under the designation of Kittyhawk Mk I and this was followed by the improved P-40E, which became the Kittyhawk Mk Ib. With the P-40F came a change of engine, the Packard Merlin; although it was planned that this would become the Kittyhawk Mk II, the type never saw service with the RAF. Next in line of the P-40 development was the 'K', originally destined for the Soviet Union under the Lend-Lease agreement and this version reverted back to the Allison V-1710-73. Only 21 examples of the latter were to serve with the RAF as the Kittyhawk Mk III while the USAAF took delivery of some 1,300 fighters.

ENTER THE P-40N

The P-40L and M were produced in parallel; the former being a stripped-down lightweight version while the latter was similar and specifically produced for the RAF. The P-40M that appeared in November 1942 was powered by an Allison V-1710-81 and although similar to the 'L' it was armed with six wing-mounted guns and was to see wide use with the RAF, Royal Australian Air Force (RAAF) and Royal New Zealand Air Force (RNZAF) as the Kittyhawk Mk III.

The P-40N was the last of the long line of 'Hawks' produced by Curtiss during the Second World War and was also to see service with Commonwealth Air Forces as the Kittyhawk Mk IV. By summer of 1943 the P-40's performance had begun to suffer compared to fighters it had to face in combat

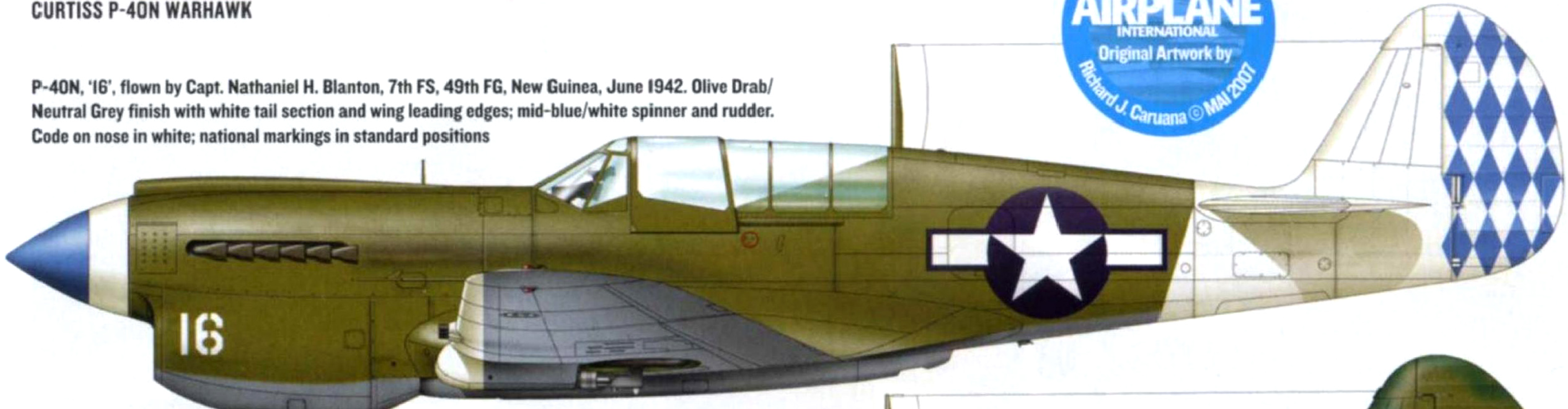
ABOVE: Kittyhawks Mk IVs of No.78 Squadron, Royal Australian Air Force, whilst on Morotai Island in 1944, identified by their 'HU' codes. Note the quick identification markings applied in this theatre of operations, including white tail section and wing leading edges (R.J. Caruana Archives)

ABOVE: 'Gloria Lyons' (NZ3140) is an early Kittyhawk Mk IV (P-40N-1) as can be noticed from the framed canopy and teardrop side windows instead of the later frameless hood and extended glazed rear section. It was photographed on Chrismas Eve of 1943 at Rabaul (R.J. Caruana Archives)

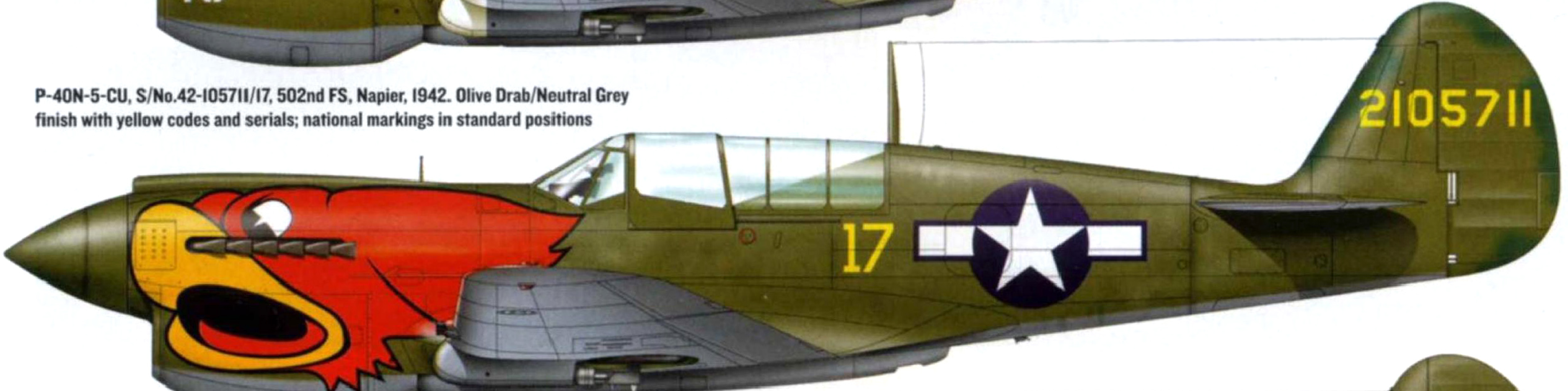
– and even of those on the Allied side, especially the North American P-51 Mustang. It was therefore decided to overhaul the whole structure of the P-40 in an effort to improve its performance and combat capabilities. At first it had been projected to power the new fighter – of which 1,500 examples were on order – with the Packard Merlin under the designation of P-40P. Shortages of Merlin engines forced the cancellation of this model and the P-40N appeared instead powered by the 1,200hp Allison V-1710-81. Apart from having a lightweight structure similar to that of the 'L' and 'M' it was lightened further through the elimination of two of the six wing-mounted guns. Smaller and lighter main undercarriage wheels were installed and radiators and oil coolers were manufactured in aluminium. Notwithstanding the re-introduction of head armour plating a considerable saving in weight had been achieved which, along with the higher-powered Allison engine, resulted in a considerable gain in overall performance; in fact, the P-40N was the fastest version of the whole series. It was also to be the version to enjoy the widest production, with 5,200 examples being built before the Curtiss Warhawk line was closed down.

The P-40N-1 appeared in March 1943 and thanks to its light weight and superb power was intended as a high-altitude interceptor. Maximum speed at 10,500ft was 378mph carrying 122 gallons of internal fuel and it had a service ceiling of 38,000ft. The 400 examples of this initial version of the P-40N could attain 15,000ft in 6.7 minutes and were armed with four wing-mounted 0.50in machine guns. The original standard cockpit canopy was radically modified on the P-40N-5 with the introduction of a frameless rear-sliding hood and a long transparent section aft, a feature that was retained on all other production blocks of the 'N'. Another significant feature was the return to a full six-gun wing armament, as the previous version was considered 'under-armed' by its pilots. Underwing pylons for bombs or fuel tanks were also fitted. Such an increase in weight meant that top speed fell to 350mph at 16,400ft. A field modification for the 'N' was possible so that reconnaissance cameras could be fitted in the fuselage. Such modified examples were designated P-40N-6. The P-40N-10 was a 'winterised' version and reverted to the four-gun wing, enabling it to climb faster than its predecessor. It was back to six guns on the P-40N-15, while the P-40N-20 was re-engined with the Allison V-1710-99 fitted with an automatic engine control unit. The P-40N-25 introduced non-metal self-sealing fuel tanks and also featured a revised instrument panel. Next in line was the P-40N-26, which in fact was a P-40N-5 fitted with reconnaissance cameras. Three two-seat conversions were produced under the designation of RP-40N-26. An order for 1,000 was placed on 14th February 1944, broken down into equal amounts of P-40N-30s and -35s. Another 1,000 examples were ordered as late as 30th June 1944 under the designation of P-40N-40, although this order was later cut back to 220 aircraft. These were powered by the Allison V-1710-115, which produced 1,360hp, and featured metal-covered ailerons. The last of this batch, and the last of 13,739 'Hawks', left the production line on 30th November 1944. ■

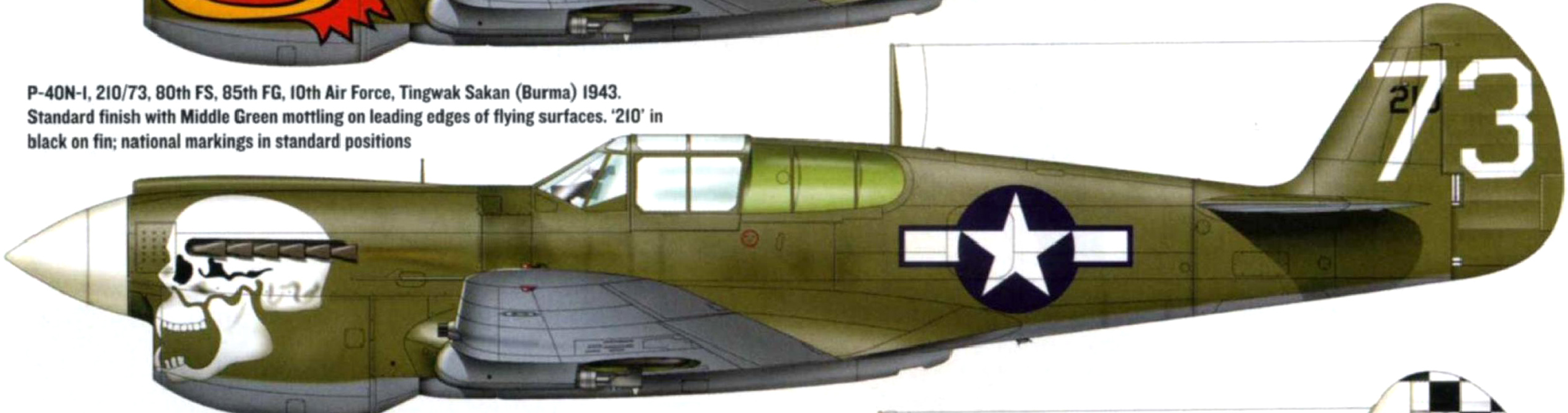
P-40N, '16', flown by Capt. Nathaniel H. Blanton, 7th FS, 49th FG, New Guinea, June 1942. Olive Drab/Neutral Grey finish with white tail section and wing leading edges; mid-blue/white spinner and rudder. Code on nose in white; national markings in standard positions



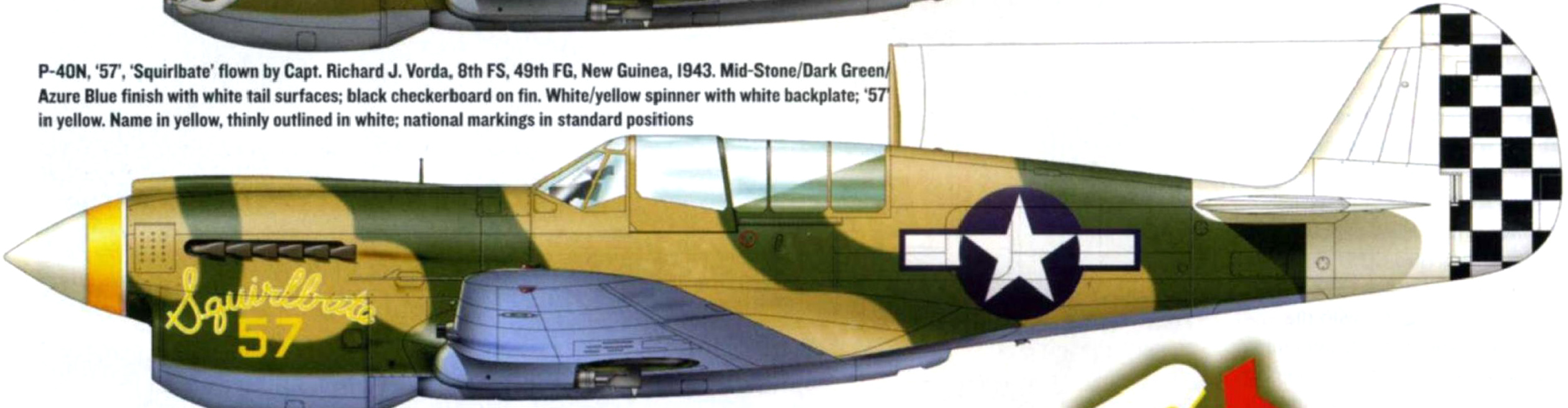
P-40N-5-CU, S/No.42-105711/17, 502nd FS, Napier, 1942. Olive Drab/Neutral Grey finish with yellow codes and serials; national markings in standard positions



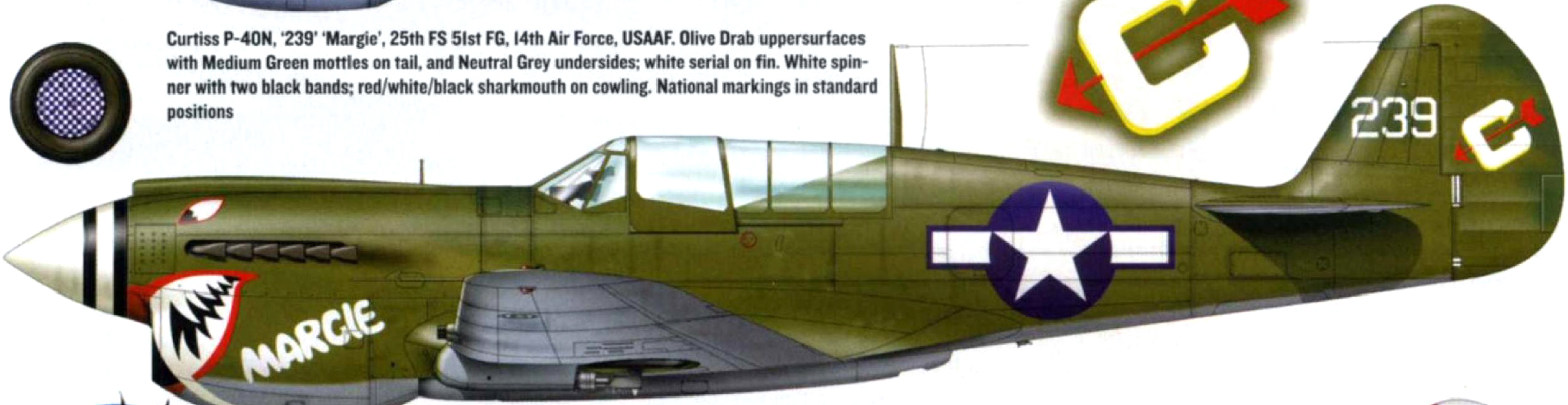
P-40N-1, 210/73, 80th FS, 85th FG, 10th Air Force, Tingwak Sakan (Burma) 1943. Standard finish with Middle Green mottling on leading edges of flying surfaces. '210' in black on fin; national markings in standard positions



P-40N, '57', 'Squirlbate' flown by Capt. Richard J. Vorda, 8th FS, 49th FG, New Guinea, 1943. Mid-Stone/Dark Green/Azure Blue finish with white tail surfaces; black checkerboard on fin. White/yellow spinner with white backplate; '57' in yellow. Name in yellow, thinly outlined in white; national markings in standard positions



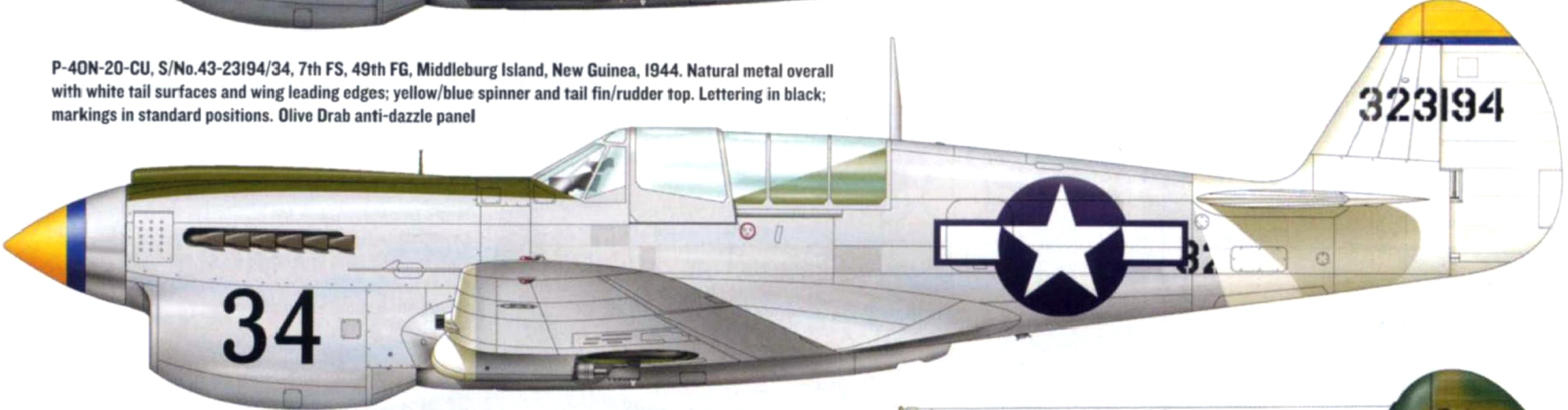
Curtiss P-40N, '239' 'Margie', 25th FS 51st FG, 14th Air Force, USAAF. Olive Drab uppersurfaces with Medium Green mottles on tail, and Neutral Grey undersides; white serial on fin. White spinner with two black bands; red/white/black sharkmouth on cowling. National markings in standard positions



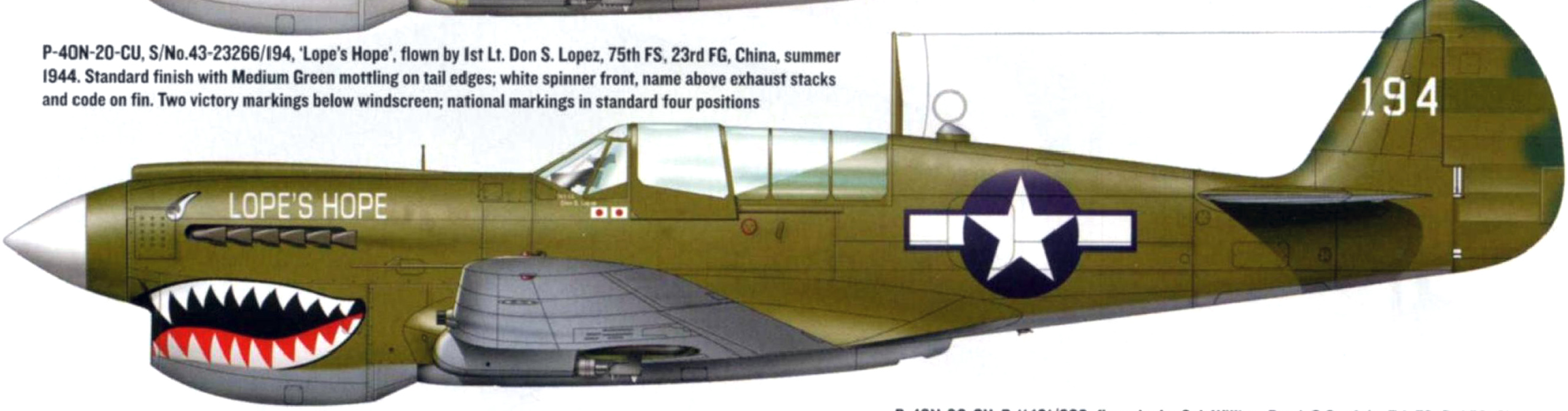
P-40N-25, S/No.43-24380/10-B, 398th FS/368th FG USAF, Hamilton Field, 1944. Natural metal overall with black anti-dazzle panel and all lettering; red spinner, fin tip and fuselage band (the latter outlined in black. Unit badge on engine cowling

P-40N-15-CU, '55', 'Kay the Strawberry Blonde', flown by Lt. Sammy A. Pierce, 8th FS, 48th FG. Olive Drab/Neutral Grey finish with white tail unit; orange spinner, '55' on nose and rear fuselage stripe (indicating Flight Leader). National markings in standard position

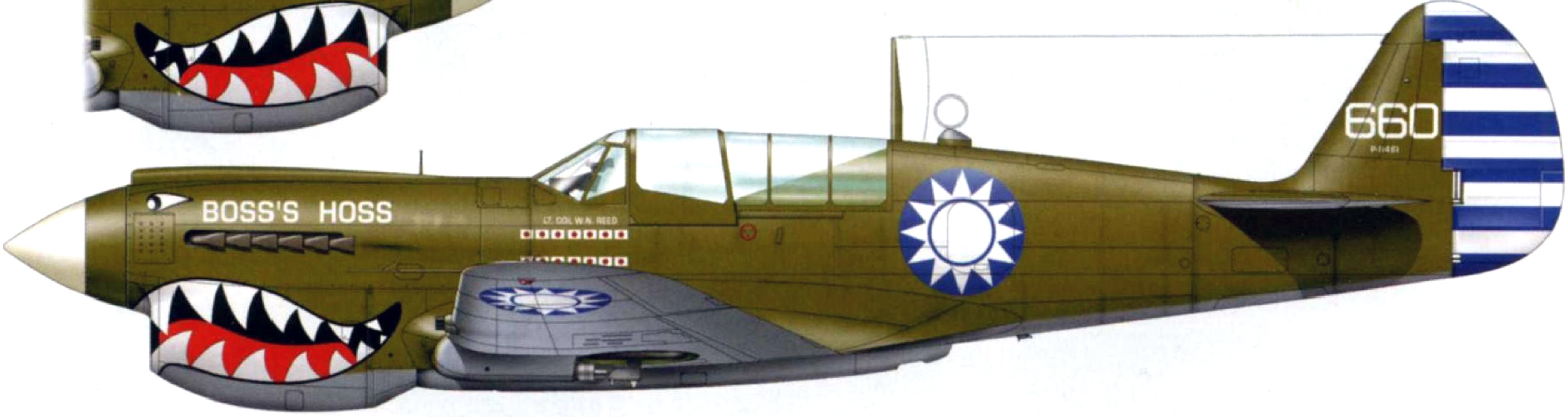
P-40N-20-CU, S/No.43-23194/34, 7th FS, 49th FG, Middleburg Island, New Guinea, 1944. Natural metal overall with white tail surfaces and wing leading edges; yellow/blue spinner and tail fin/rudder top. Lettering in black; markings in standard positions. Olive Drab anti-dazzle panel



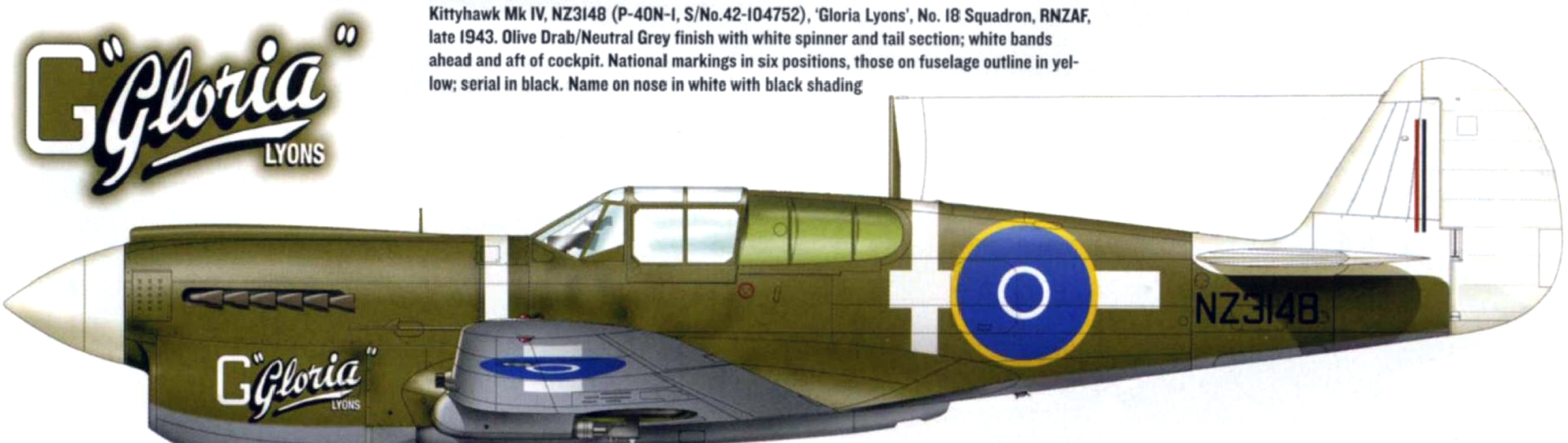
P-40N-20-CU, S/No.43-23266/194, 'Lope's Hope', flown by 1st Lt. Don S. Lopez, 75th FS, 23rd FG, China, summer 1944. Standard finish with Medium Green mottling on tail edges; white spinner front, name above exhaust stacks and code on fin. Two victory markings below windscreen; national markings in standard four positions



P-40N-20-CU, P-11461/660, flown by Lt. Col. William Reed, C.O. of the 7th FS, 3rd FG, Chinese-American Composite Wing, Liangshan, China, August 1944. Olive Drab/Neutral Grey finish with white spinner front; Chinese national markings in six positions; black/red/white sharkmouth motif. 'Boss's Hoss' on port and 'Jug's Plug' (see scrap view at left) on starboard in white. Pilot's name in white below windscreen together with 14 victory markings



Kittyhawk Mk IV, NZ3148 (P-40N-1, S/No.42-104752), 'Gloria Lyons', No. 18 Squadron, RNZAF, late 1943. Olive Drab/Neutral Grey finish with white spinner and tail section; white bands ahead and aft of cockpit. National markings in six positions, those on fuselage outline in yellow; serial in black. Name on nose in white with black shading



HISTORICAL FEATURE

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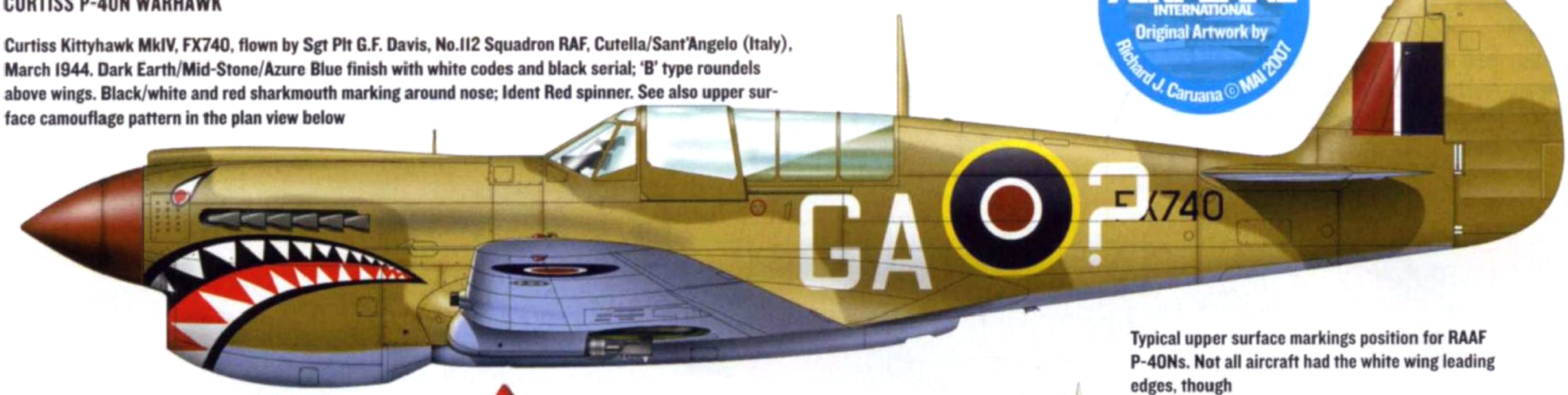
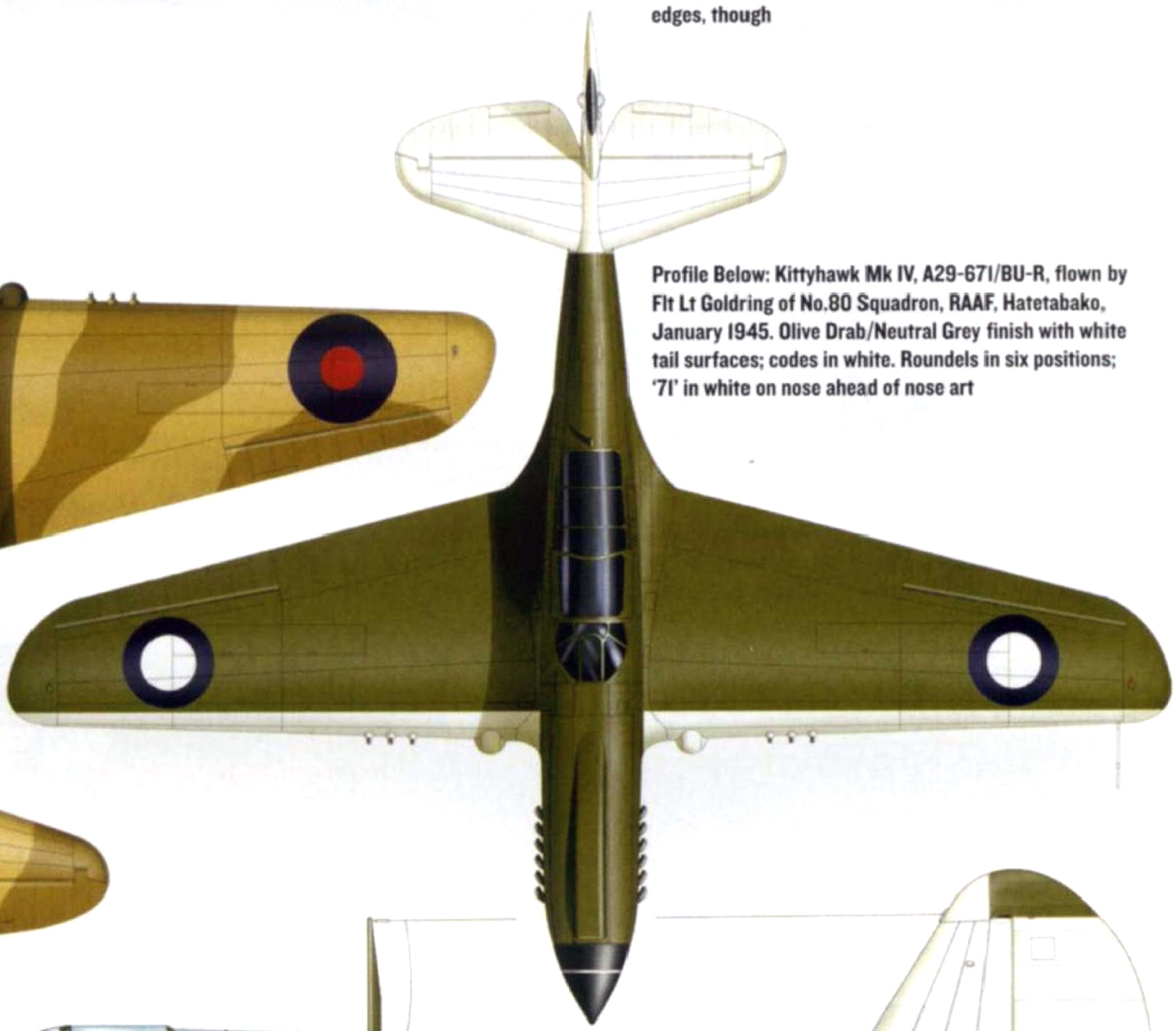
Curtiss Kittyhawk MkIV, FX740, flown by Sgt Plt G.F. Davis, No.112 Squadron RAF, Cutella/Sant'Angelo (Italy), March 1944. Dark Earth/Mid-Stone/Azure Blue finish with white codes and black serial; 'B' type roundels above wings. Black/white and red sharkmouth marking around nose; Ident Red spinner. See also upper surface camouflage pattern in the plan view below



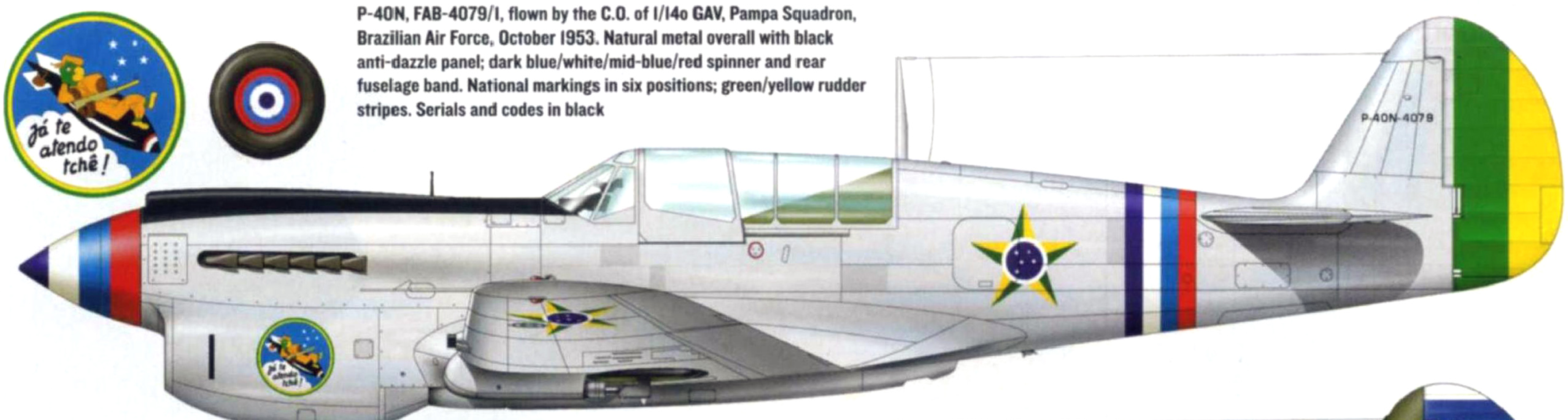
Typical upper surface markings position for RAAF P-40Ns. Not all aircraft had the white wing leading edges, though



Profile Below: Kittyhawk Mk IV, A29-671/BU-R, flown by Flt Lt Goldring of No.80 Squadron, RAAF, Hatetabako, January 1945. Olive Drab/Neutral Grey finish with white tail surfaces; codes in white. Roundels in six positions; '71' in white on nose ahead of nose art

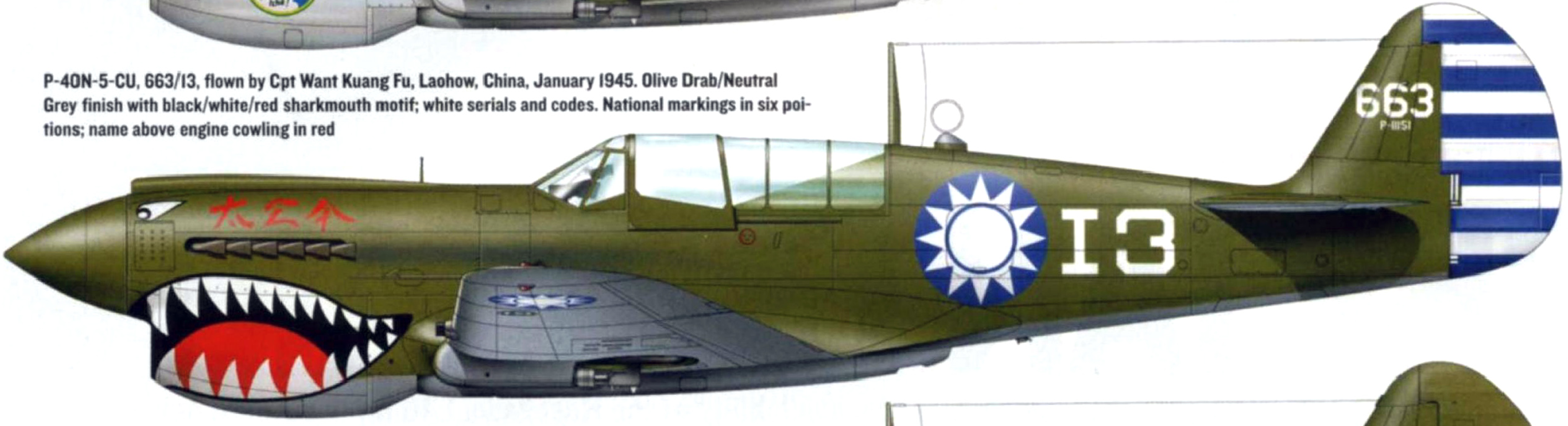
Above: Kittyhawk Mk IV, A29-607/BU-G, flown by Sqn Ldr J.L. Waddy, No.80 Squadron, RAAF. Olive Drab/Neutral Grey finish with white tail unit and wing leading edges. Codes in light grey, serial in medium grey; roundels in six positions. '07' in white on nose; 18 victory markings with 'VE' in white below

Kittyhawk Mk IV, A-29-844/FA-E, No 82 Squadron RAAF, Labaun (Borneo), 1944. Olive Drab/Neutral Grey finish with white codes; red/white checkers along top of fin/rudder. Serial in Neutral Grey; roundels in six positions



P-40N, FAB-4079/1, flown by the C.O. of 1/14o GAV, Pampa Squadron, Brazilian Air Force, October 1953. Natural metal overall with black anti-dazzle panel; dark blue/white/mid-blue/red spinner and rear fuselage band. National markings in six positions; green/yellow rudder stripes. Serials and codes in black

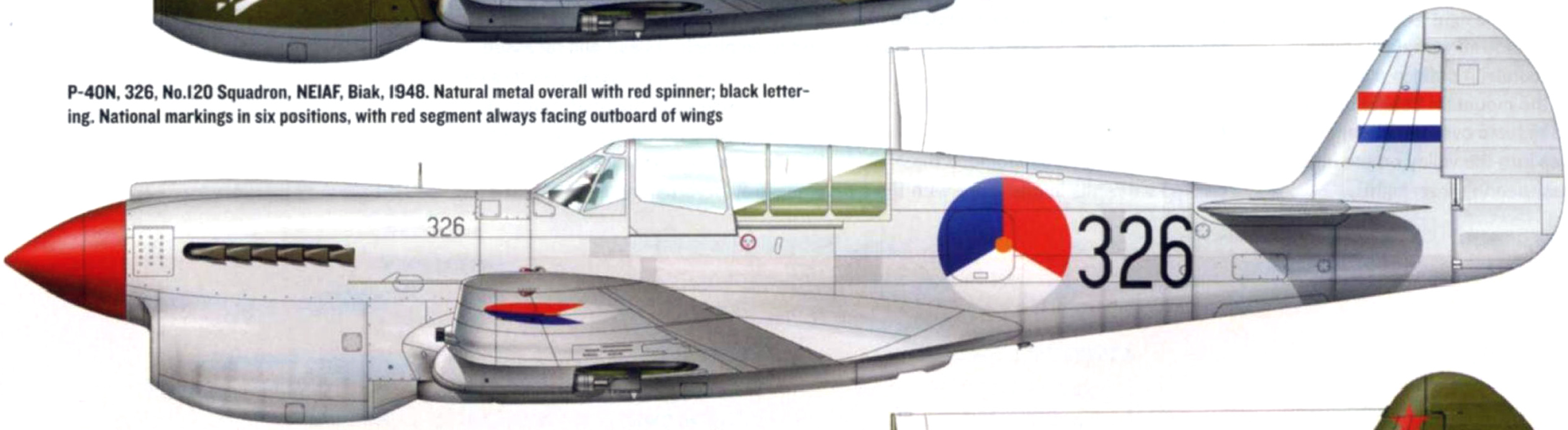
P-40N-5-CU, 663/13, flown by Cpt Want Kuang Fu, Laohow, China, January 1945. Olive Drab/Neutral Grey finish with black/white/red sharkmouth motif; white serials and codes. National markings in six poitions; name above engine cowling in red



Kittyhawk Mk IV, C3-503, 'Wham Bam!', No.120 Squadron, Netherlands East Indies Air Force (NEIAF), Merauke, Dutch New Guinea, 1944. Olive Drab/Neutral Grey finish with red spinner; serial above engine exhaust stack in white. National markings in six positions; name on nose in white

Kittyhawk Mk IV, 'H', 'Snafu', No.120 Squadron, Netherlands East Indies Air Force, Merauke, Dutch New Guinea, late 1944. Olive Drab/Neutral Grey finish with white spinner; code 'H' in orange. National markings in six positions; name in white on nose

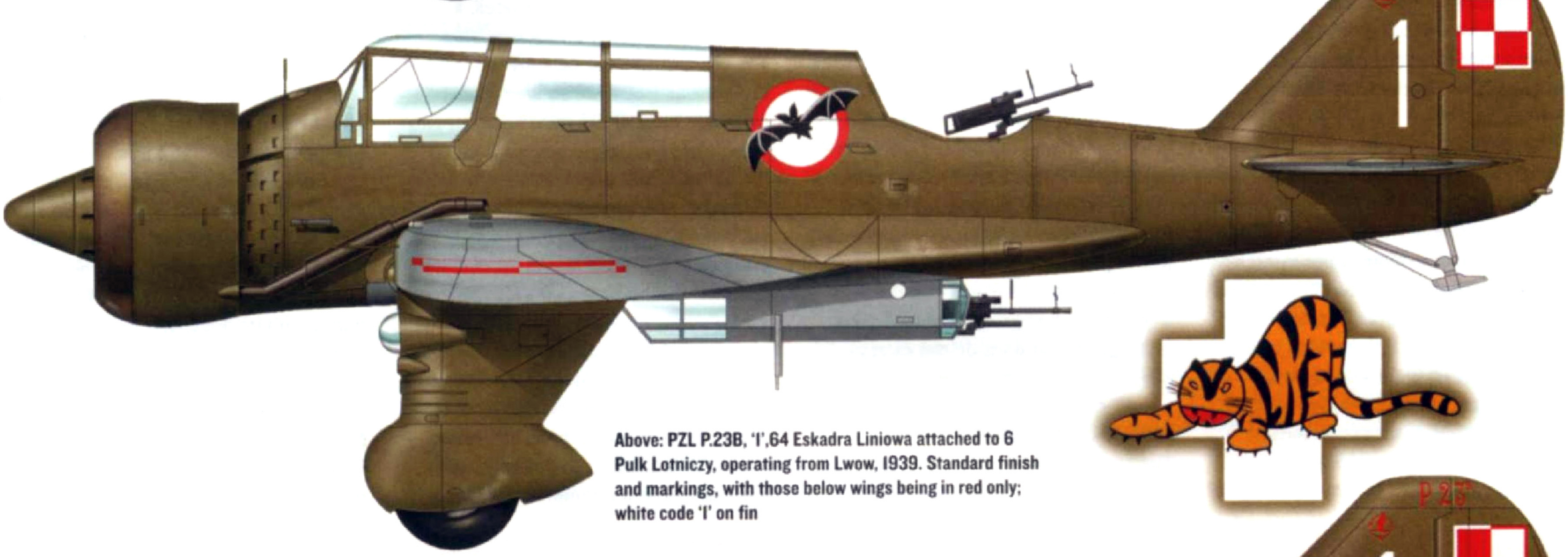
P-40N, 326, No.120 Squadron, NEIAF, Biak, 1948. Natural metal overall with red spinner; black lettering. National markings in six positions, with red segment always facing outboard of wings



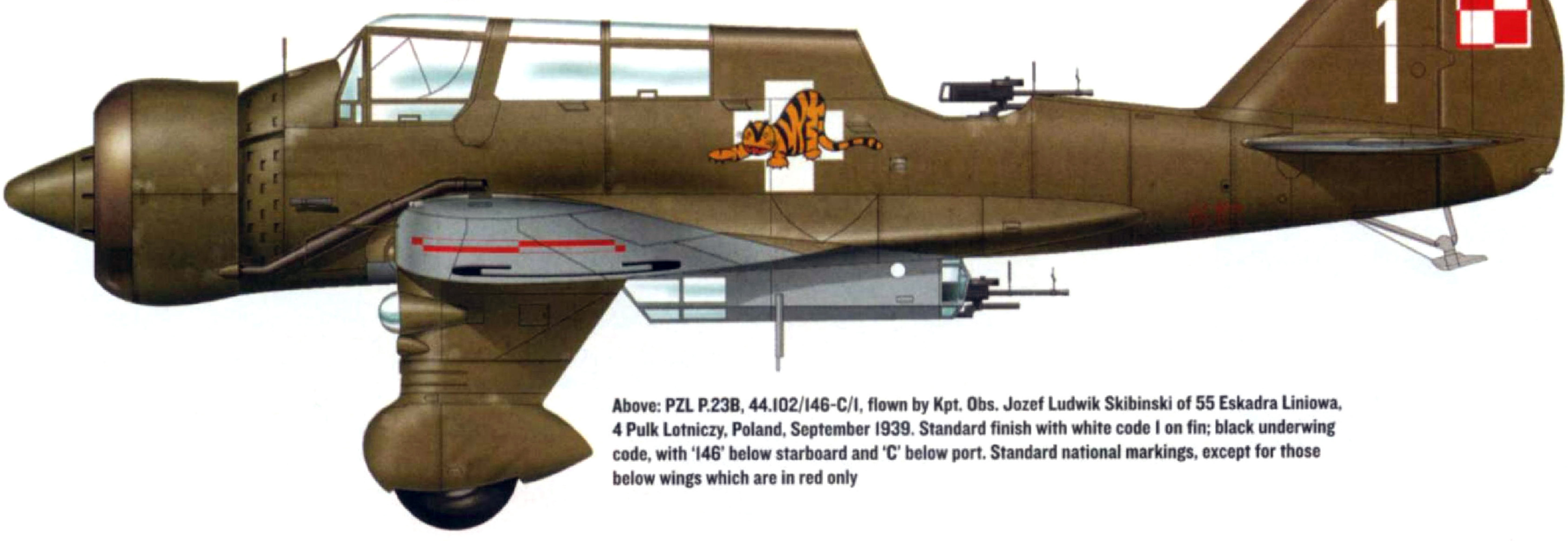
P-40N, 7223/8, No. 2 GvIAP, Northern Fleet Aviation, late 1943. Olive Drab/Neutral Grey finish with white/red spinner; code in white, serial in black at base of fin. Red stars on fuselage sides outlined in white, repeated in red only below wings; black/white motif on vertical tail surfaces. Slogan below cockpit reads 'For Safonov'

Above: PZL P.23B, 44.188/112-N/9, 12 Eskadra Liniowa, I Pulk Lotniczy, Poland, September 1939. Light Khaki (*Khaki jasny*) FS30118/Light Blue Grey (*Szaroblekitny*) FS36329 finish with red serial (44.188) on lower rear fuselage; white code '112' below starboard wing, 'N' below port wing. Standard national markings with those below wings in red only

Above: PZL P.23B, 22-D/2, Aviation Cadets School, Deblin. Standard finish and national markings, with those below wings being in red only; code '2' in white. White underwing codes, '22' below starboard and 'D' below port

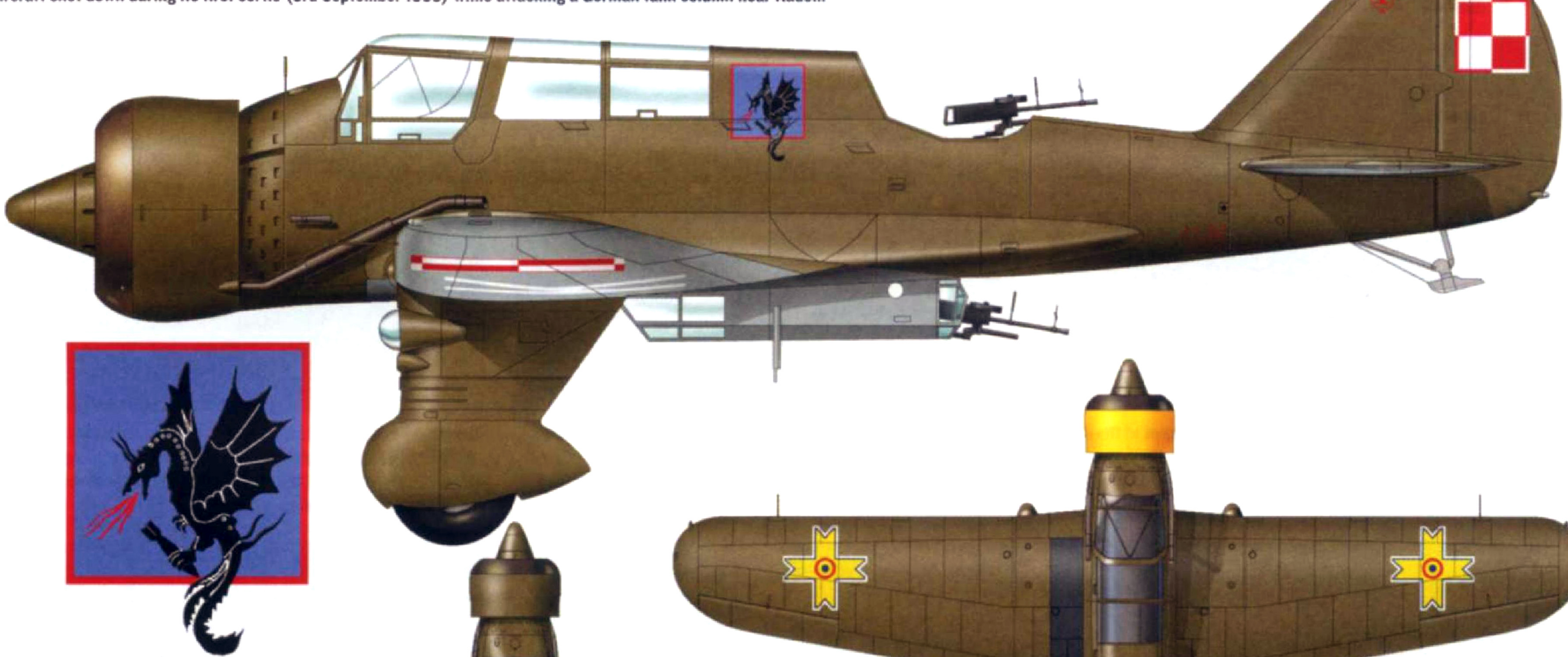


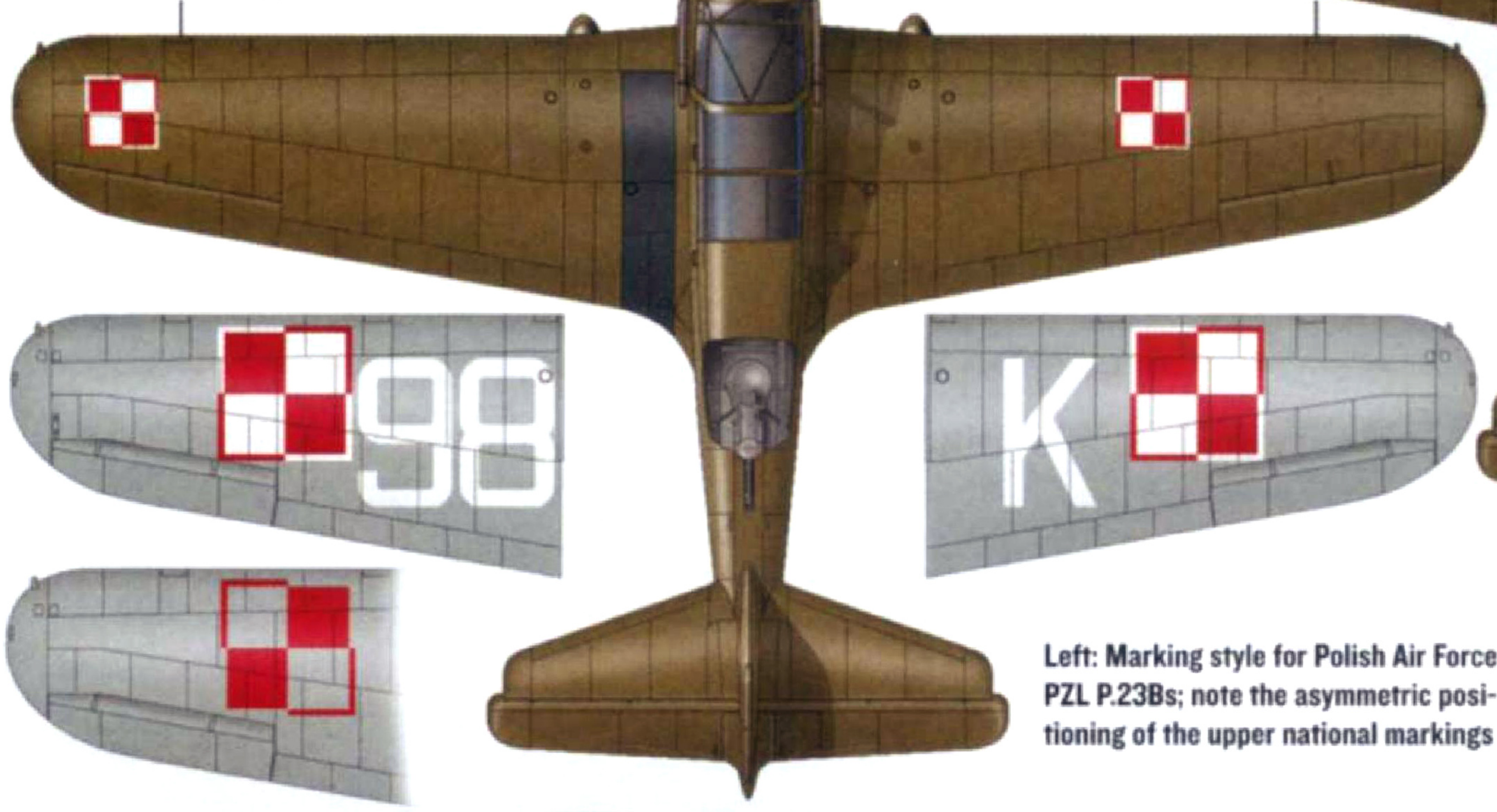
Above: PZL P.23B, 'I',64 Eskadra Liniowa attached to 6 Pulk Lotniczy, operating from Lwow, 1939. Standard finish and markings, with those below wings being in red only; white code 'I' on fin

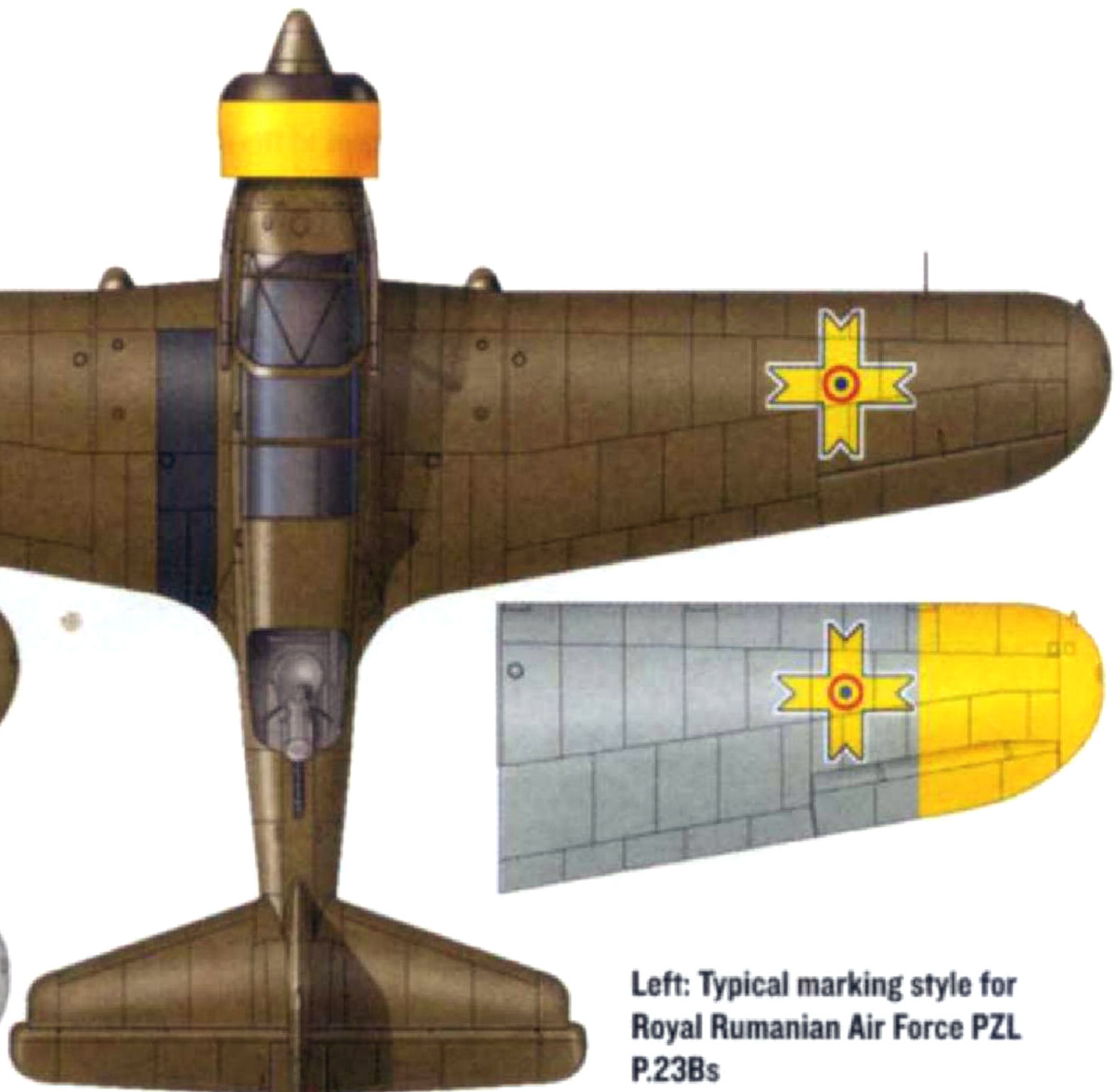


Above: PZL P.23B, 44.102/146-C/I, flown by Kpt. Obs. Jozef Ludwik Skibinski of 55 Eskadra Liniowa, 4 Pulk Lotniczy, Poland, September 1939. Standard finish with white code I on fin; black underwing code, with '146' below starboard and 'C' below port. Standard national markings, except for those below wings which are in red only

PZL P.23B, 44.86/98-K/DI, 22 Eskadra Liniowa, 2 Pulk Lotniczy, Poland, September 1939. Standard finish and markings; code '98' in white below starboard wing, 'K' below port. Aircraft shot down during its first sortie (3rd September 1939) while attacking a German tank column near Radom

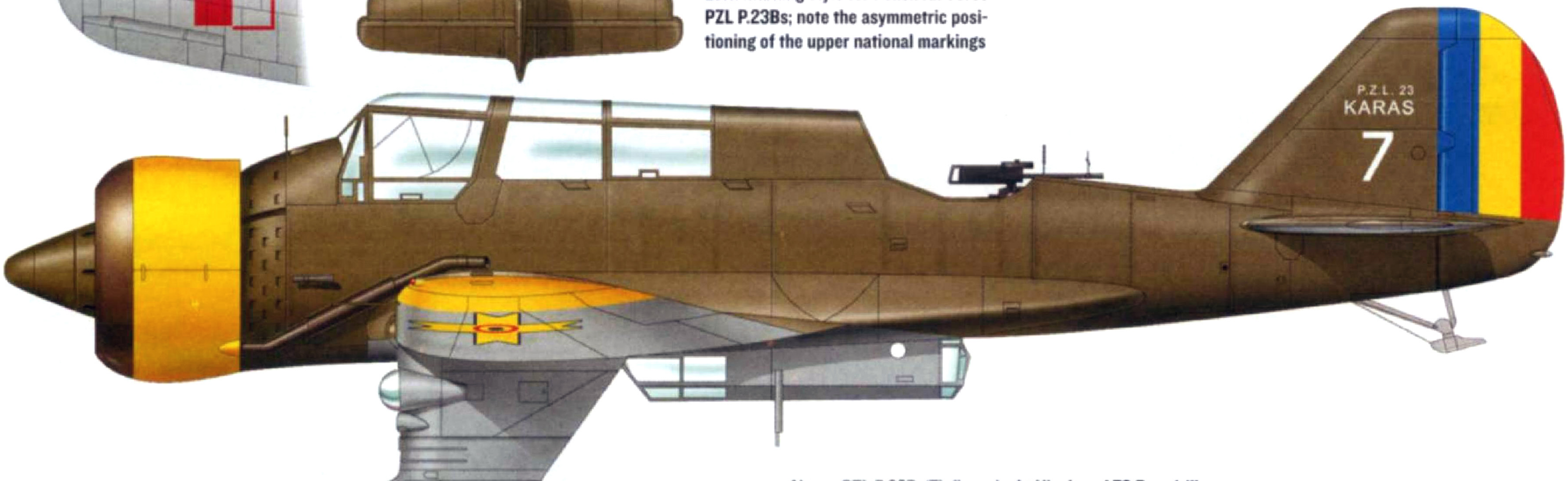




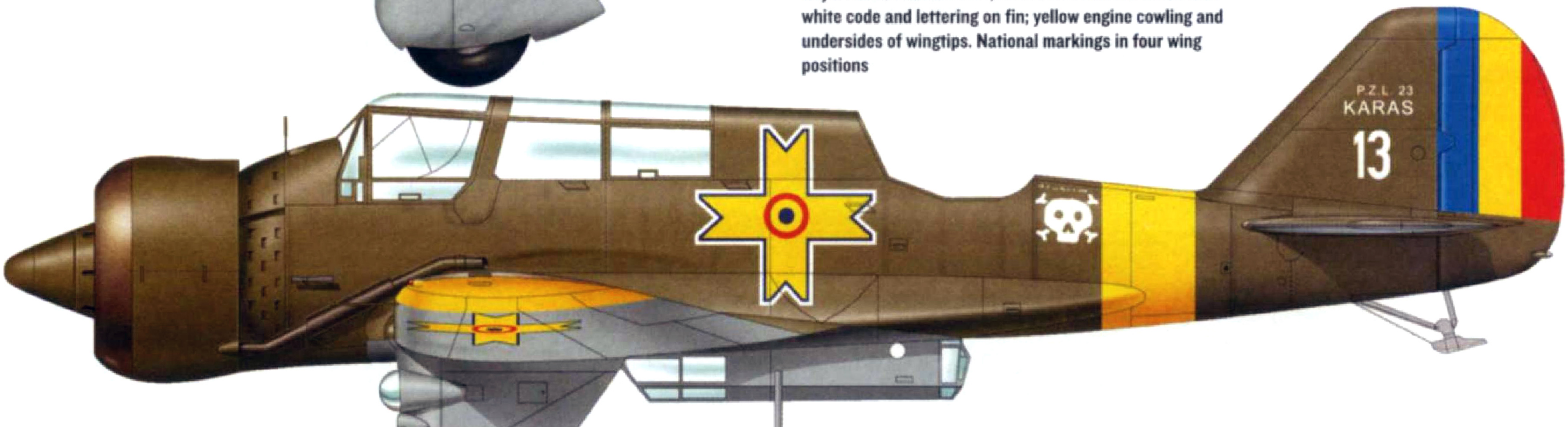


Left: Typical marking style for Royal Rumanian Air Force PZL P.23Bs

Left: Marking style for Polish Air Force PZL P.23Bs; note the asymmetric positioning of the upper national markings



Above: PZL P.23B, '7', flown by Lt Nicolov of 73 Escadrilla. Royal Rumanian Air Force, late 1941. Standard finish with white code and lettering on fin; yellow engine cowling and undersides of wingtips. National markings in four wing positions



Above: PZL P.23B, '13', 73 Escadrilla. Royal Rumanian Air Force, Morozovskaya (Stalingrad), winter 1942-43. Standard finish with white code and lettering on fin; yellow undersides of wingtips and rear fuselage band. National markings in six wing positions

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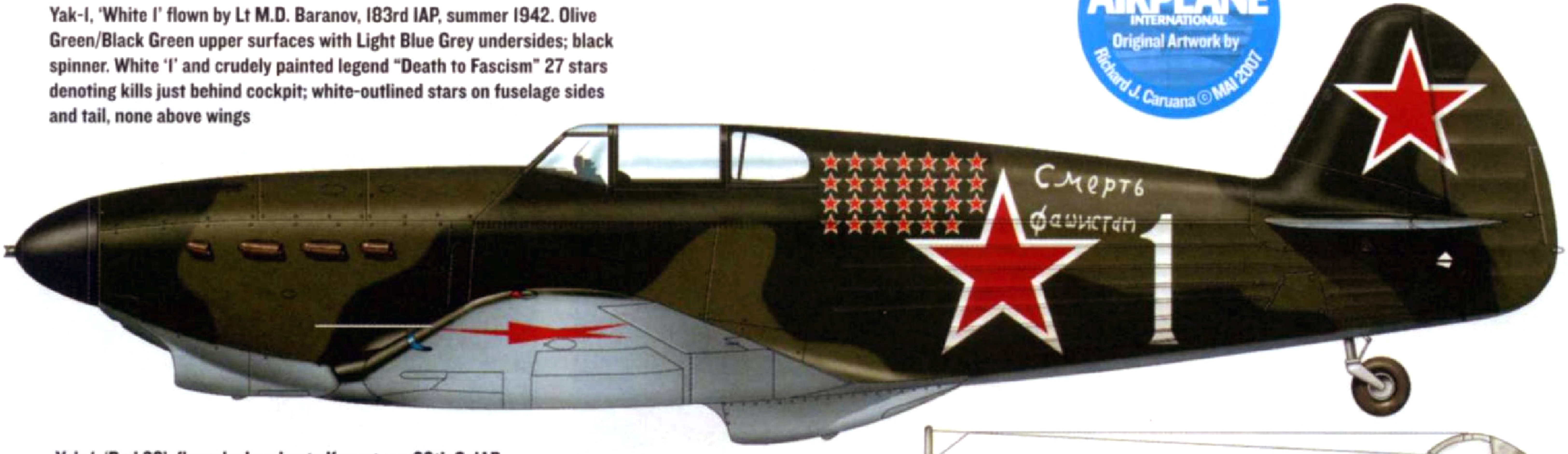
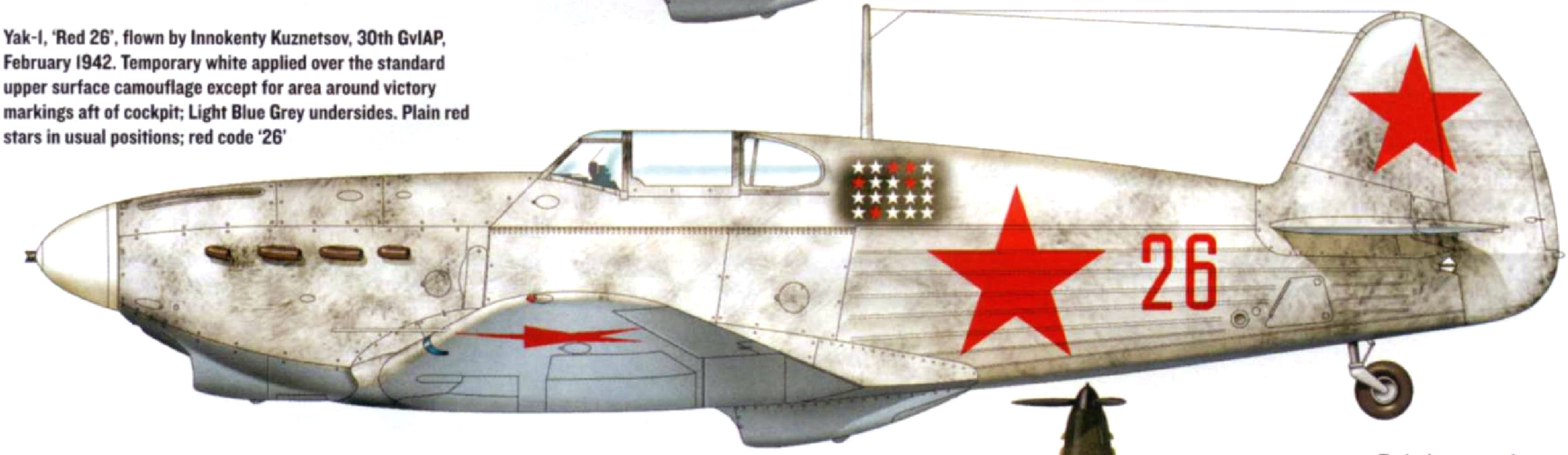
Yak-1, 'White 1' flown by Lt M.D. Baranov, 183rd IAP, summer 1942. Olive Green/Black Green upper surfaces with Light Blue Grey undersides; black spinner. White '1' and crudely painted legend "Death to Fascism" 27 stars denoting kills just behind cockpit; white-outlined stars on fuselage sides and tail, none above wings

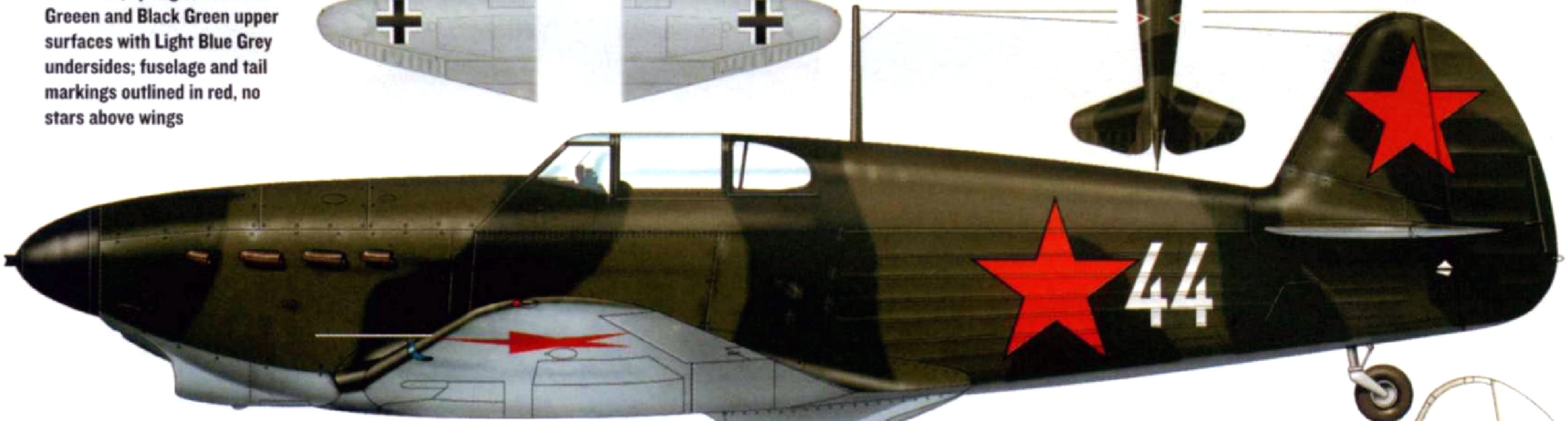


Yak-1, 'Red 26', flown by Innokenty Kuznetsov, 30th GvIAP, February 1942. Temporary white applied over the standard upper surface camouflage except for area around victory markings aft of cockpit; Light Blue Grey undersides. Plain red stars in usual positions; red code '26'



Typical upper surface camouflage pattern for the Yak-1; note that no red stars were usually painted above the wings

Yak-1, 'White 44', flown by woman ace 2nd Lt Lydia Litvjak, 296th IAP, spring 1943. Olive Greeen and Black Green upper surfaces with Light Blue Grey undersides; fuselage and tail markings outlined in red, no stars above wings



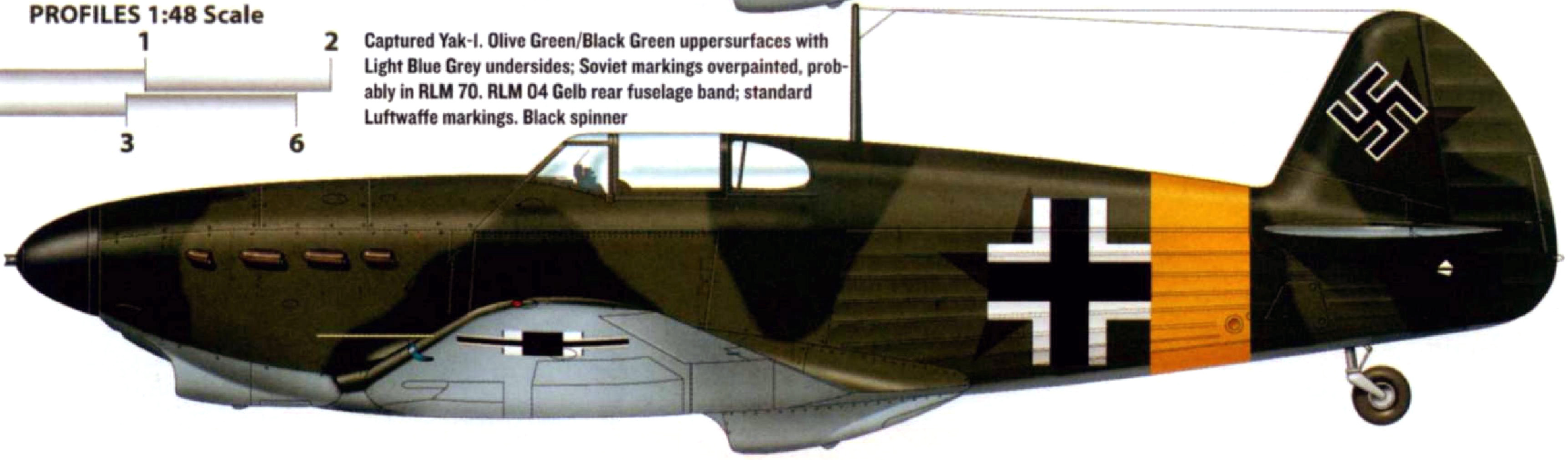
Yak-1, 'White 49', flown by Capt. Tsogaiko Nikolay Vasilevich, 112nd IAP, summer 1943. Olive Green/Black Green upper surfaces with Light Blue Grey undersides; plain red stars on fuselage sides, tail and below wings, none above wings. White spinner, code and tail markings

PROFILES 1:48 Scale

0 1 2

0 3 6

Captured Yak-1. Olive Green/Black Green uppersurfaces with Light Blue Grey undersides; Soviet markings overpainted, probably in RLM 70. RLM 04 Gelb rear fuselage band; standard Luftwaffe markings. Black spinner



A view of Mk If, X7543 clearly showing the painted undersides; of note is the position of underwing roundels at the extreme wingtips (R.J. Caruana Archives)

WRITTEN BY RICHARD J. CARUANA

(The Fighter Versions) WHISPERING DEATH

This was the name given to the Beaufighter by Japanese troops in the Far East, who experienced the combination of its devastating firepower along with its quiet approach at low level afforded by its radial engines

As early as 1935, the Royal Air Force (RAF) had issued Specification F37/35 calling for a single- or twin-engined fighter armed with four cannon. Bristol Aeroplane Co. Ltd tendered without success for both F.37/35 and F.18/37 that was issued two years later. While the RAF had high hopes in the future of the Westland Whirlwind there was still a need for a long-range twin-engined, cannon-armed fighter that could take the battle well into enemy territory.

By 1938, Bristol had fully geared up for the development and production of the Blenheim and Beaufort. Leslie G. Grise, who succeeded Captain F. Barnwell after his demise, immediately took stock of the situation upon his appointment and understood that the long-range day and night fighters that the RAF had on plan would not be realised in the near future. A much quicker answer to designing and developing such aircraft could be found in a similar way that the Beaufort had been derived from the Blenheim. By maximising the use of existing gigs and components, Bristol went ahead with a private venture in an attempt to produce such a fighter in the shortest possible time.

On the premise that a fighter would need higher power than that of a bomber, the Beaufort's 1,000hp Bristol Taurus engines were replaced by 1,500hp Hercules - also produced by the mother company; these engines required larger-diameter propellers, meaning that the nose section had to be cut back while wings, engine nacelles, undercarriage and tail unit were retained. Ground clearance for these propellers also meant a revision of the engine nacelles, however, as their centreline was raised to meat the wing leading edges.

Another departure was the use of an egg-shaped cross section for the forward fuselage, narrow at the top and nearly flat at the bottom that was then merged into the standard Beaufort aft section complete with forward retractable tailwheel and tail unit. The pilot sat centrally in a wide cockpit, above the four belly-mounted 20mm cannon, while the second crew member, whose duties included those of observer-navigator and cannon loader (interchangeable 60-round drums per cannon), sat half-way down the fuselage beneath a bubble canopy.

Only a few days after the Beaufort's maiden flight in October 1938, Bristol forwarded its proposal to the Air Ministry under the designation of Type 156. Within weeks, the company received official authorisation to begin work on four prototypes, initiating detail design work on 16th November. Parallel to Type 156, the company had proposed Type 157 as a three-seat fast bomber version (the third crew member manning a dorsal turret) and Type 158 that featured a much slimmer fuselage cross-section.

Prototype R2052 was built in the short span of six months, received the name 'Beaufighter' in March 1939 and flew for the first time the following 17th July powered by a pair of Hercules Mk.III engines. Meanwhile, Bristol had already been awarded an initial production order for 300 examples 'off the drawing board' covered by Specification F.17/39. Although Hercules Mk VI engines (1,615hp) had been planned for the Beaufighter, Mk IIIs were selected for the initial production batch to ensure availability of power plants. Even then, as Hercules engines had been earmarked for the planned vast bomber production programme an alternative was considered in the form of the Rolls-Royce Griffon (one prototype - T3177 - being built).

First Beaufighter Mk IIf, R2058, finished in the standard Dark Earth/Dark Green/Dark Earth scheme with Yellow undersides (R.J. Caruana Archives)

While Bristol had passed from initial design to maiden flight in around nine months it would take more months to deal with a number of requests for modifications that included changes to the main undercarriage to a longer-stroke Lockheed unit, increase of fin area and a reduction of 3 inches in propeller diameter to improve ground clearance. This meant that R2052 was only handed over to the RAF on 2nd April 1940, with the second prototype (R2053) followed two weeks later. R2054, the first example to be fully-equipped, suffered a loss in overall performance compared to the first prototype.

Being such a large aircraft, the Beaufighter definitely needed more powerful engines and as Griffons were now being reserved for the Fairey Firefly the chose fell on Merlins XXs. Rolls-Royce undertook the conversion of the first pair of Merlin-engined Beaufighters Mk II (to be distinguished from the Hercules III-powered Mk I) with the first example (R2058) performing its first flight at Hunchall in July 1940. By September it had been delivered to Filton, when total of aircraft on order had risen to 1,218.

INTO SERVICE

An initial batch of five Beaufighters was handed over to the RAF on 27th July 1940, a second batch arriving early in August. Two shadow factories - at Stockport and Weston-Super-Mare - were commissioned to accelerate production of the type. A number of improvements were incorporated into the Beaufighter as deliveries progressed.

Most important among these was the replacement of the original manual change of cannon rounds magazine. Bristol proposed a recoil-operated feed of its own design, and later a servo-feed as installed and tested on R2055 in May 1940. The Ministry of Aircraft Production (MAP) ordered the installation of the French Chatellerault recoil system instead, but its protracted development meant that it could only be installed after the first 400 examples had been delivered. Meanwhile, six 0.303in (7.7mm) Browning machine guns were fitted inside the wings (four starboard, two port) from the 51st example onward.

On 2nd September 1940 No.25 Squadron at North Weald, No.29 Squadron at Digby, No.219 Squadron at Catterick and No.604 Squadron at Middle Wallop received a single Beaufighter each for familiarisation training. No.600 Squadron at Hornchurch followed suit six days later. Slowly these units were equipped with more Beaufighters as the Battle of Britain turned into the Winter Blitz. Although No.29 Squadron recorded the first night operational sortie on the type on 17th/18th September, the first kill was credited to No.219 Squadron, when Sgt Hodgkinson and Sgt Benn shot down a Dornier Do 17 while flying R2097 on 25th October.

Deliveries of the Merlin-powered Mk IIs began in April 1941 when R2277 was handed over to No.604 Squadron while No.600 Squadron received R2278 shortly afterwards. Bristol experimented with a Defiant-style turret fitted to R2274 and R2306 that had their wing guns and a pair of the belly cannon removed. The pair, designated Mk V, was issued for operational trials to Nos.406 and 29 Squadrons; it would appear that the crews did not report favourably, especially as the turret mechanism obstructed the emergency exit.

At that time it had been decided that supply of Merlin engines would be reserved for Lancaster production, so Bristol had to finish the final 120 Mk IIs with Hercules XI engines (which were in fact Mk IIIs converted to operate on 100-octane fuel).

Out came the wing guns, once again, to make way for extra internal fuel in response for the need of a long-range fighter for the Middle East. To distinguish the two Mk Is, the earlier version became the Mk If, the latter the Mk Ic. Until enough wing tanks became available, some early examples had extra fuel installed in tanks positioned on the floor between the cannon bays. First Mk Ic delivered went to No.252 Squadron (T3228) on 8th March 1941 and within a month the unit was flying detachments from North Africa and Malta. Such was the success met by this type that No.252 remained in that theatre for the remainder of the war.

No.272 Squadron was similarly employed while Nos.46 and 89 Squadrons flew Beaufighters in the night intruder role. During July 1941 alone, No.272 claimed 49 enemy aircraft destroyed and 42 damaged while operating from Malta. Night fighter versions of the Beaufighter were all equipped with radar, the typical 'arrow-head' AI Mk IV antenna fitted to the nose, its receiver antennae fitted to each side of the wing leading edges while a pair of short aerials were fitted at an angle above and below the starboard wing only.

BEEFING UP THE BEAU

The Beaufighter Mk VI was practically a Mk I re-engined with the Hercules VI, that helped improved performance; 333mph (535km/h) could now be reached at 15,600ft (4750m). This version was also produced in two subversions, the VIf indicating the fighter version while the VIc was produced for Coastal Command and were distinguished by the wing armament/wing tankage fit respectively.

By spring of 1943, Nos. 255 and 600 Squadrons, equipped with the Mk VIf had been transferred to North Africa causing enormous damage among retreating German columns and aircraft ferrying material back to Europe. On 30th April, Flt Sgt Downing and Sgt Lyons of No.600 Squadron shot down five Ju 52s near Setif within ten minutes. Back on the home front, No.219 Squadron pioneered a system (later picked up by Mosquito crews) of flying among enemy night fighters while escorting RAF bombers, enticing the enemy to follow them until, with a sharp turn at the last moment the Beaufighter pilot put his quarry within his sight.

The uniform finish of this Beaufighter Mk If is rather misleading; in fact the upper surfaces are still unpainted and references indicate that it is still in dark grey primer. The other photograph of this same aircraft shows the undersides painted in Sky (R.J. Caruana Archives)

It was the Beaufighters of No.176 Squadron operating in Burma that earned the type its nickname of 'Whispering Death', having achieved complete surprise on Japanese troops at Myitkyina during the Emperor's birthday parade. The final batch of 250 Mk VIf examples was fitted with AI Mk VIII radar installed in a thimble nose.

The final fighter version was the Mk X built at the Rootes and Weston plants fitted with both nose scanner and torpedo gear. Internal equipment continued to be added as production progressed and weight began to penalise both performance and stability. Although some of the latter had been regained through the addition of dihedral to the tailplane it was found necessary to enlarge fin area through the addition of a dorsal fin, originally tested on Beaufighter Mk IIf T3032. Most Mk Xs went to Coastal Command units except for a small number that were used in the ground attack role - particularly in Burma - armed with eight rocket projectiles, four beneath each wing.

EXPORT BEAUFIGHTERS

The Royal Australian Air Force (RAAF), following its experience on a number of Mk Ic, VIc and Mk Xs it had operated (A19-1 to A19-218) decided to switch Beaufort production at Fisherman's Bend to Beaufighter Mk X, which in RAAF service was designated Mk 21.

Powered by Hercules XVIII engines, these aircraft however lacked nose radar and the typical dorsal fin of the Mk X and, while they retained the two 0.303in guns in the port wing had the four in the starboard wing replaced by 0.50in (12.7mm) guns. A8-1, the first Mk 21, flew for the first time on 16 May 1944. The total of 364 machines built were delivered to Nos.22, 30, 31, 92 and 93 Squadrons. RAAF.

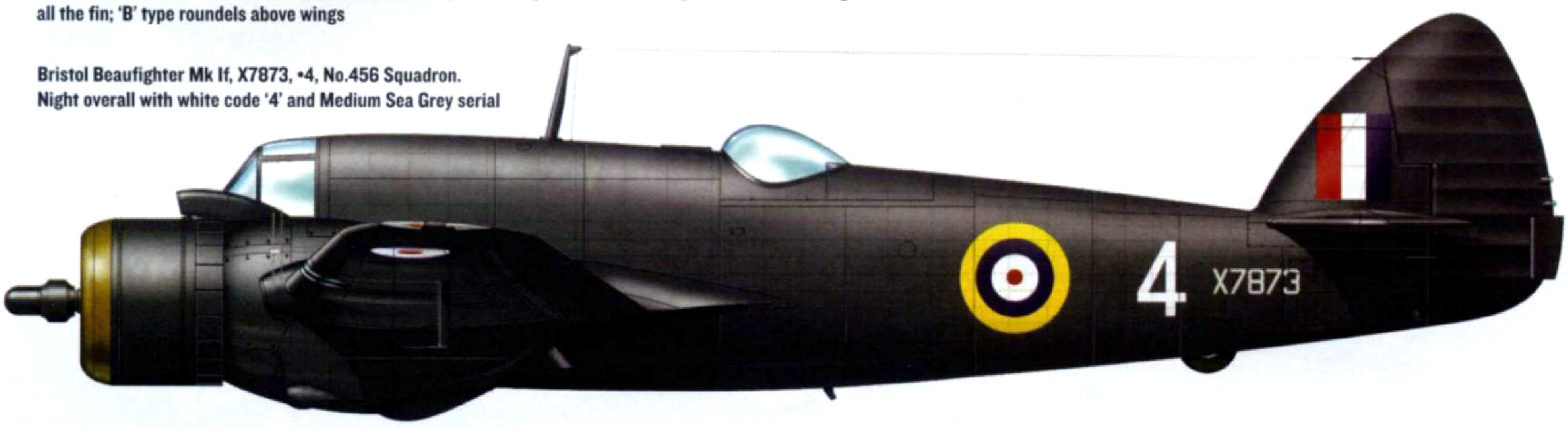
As units of the First Tactical Command of the United States Army Air Force (USAAF) in North Africa awaited the delivery of the P-61 Black Widow, they were supplied with 100 Beaufighters Mk VIf in the summer of 1943. These consisted of the 414th, 415th, 416th and 417th Night Fighter Squadrons. Even after the arrival of the P-61 in December 1944, USAAF Beaufighters remained in operational service in Italy and France until late in the war.

Turkey received some Mk Xs in 1944, augmented by a further number after the war's end. Portugal received a total of 17 TF Mk Xs to form Esquadrilla 8 of the Forcas Aereas du Armada (Naval Air Arm). Ten Mk Xs were delivered to the Domincan Air Force while Israel is known to have received four examples.

The defining line between versions of the Beaufighter is rather blurred, for being such a versatile machine it is difficult to distinguish between pure fighter versions and others. Scope of the feature was to cover those versions used in the interceptor and light attack role; in future we shall take a close look at other versions, particularly those operated in various roles by Coastal Command. ■

Above: Bristol Beaufighter Mk If, R2059, ZK•A, No.25 Squadron, Autumn 1940. Dark Earth/Dark Green upper surfaces with Sky undersides; Medium Sea Grey codes, Night serials. Note angled fin flash covering all the fin; 'B' type roundels above wings

Bristol Beaufighter Mk If, X7873, •4, No.456 Squadron. Night overall with white code '4' and Medium Sea Grey serial



Bristol Beaufighter Mk If, R2198, PN•B, No.252 Squadron, Middle East, Spring 1941. Dark Earth/Light Earth upper surfaces with Light Mediterranean Blue undersides except for ailerons and elevators which remain in Sky; Medium Sea Grey codes, Night serials and spinners

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

Bristol Beaufighter Mk If, T4638, NG•F, No.604 Squadron, Middle Wallop, February 1941. Night overall with codes and serials in Medium Sea Grey; 'B' type roundels above wings

Bristol Beaufighter Mk IIf, R2445, EW•A, No.307 Squadron, December 1941. Night overall with Dull Red serials and Medium Sea Grey codes; 'B' roundels above wings

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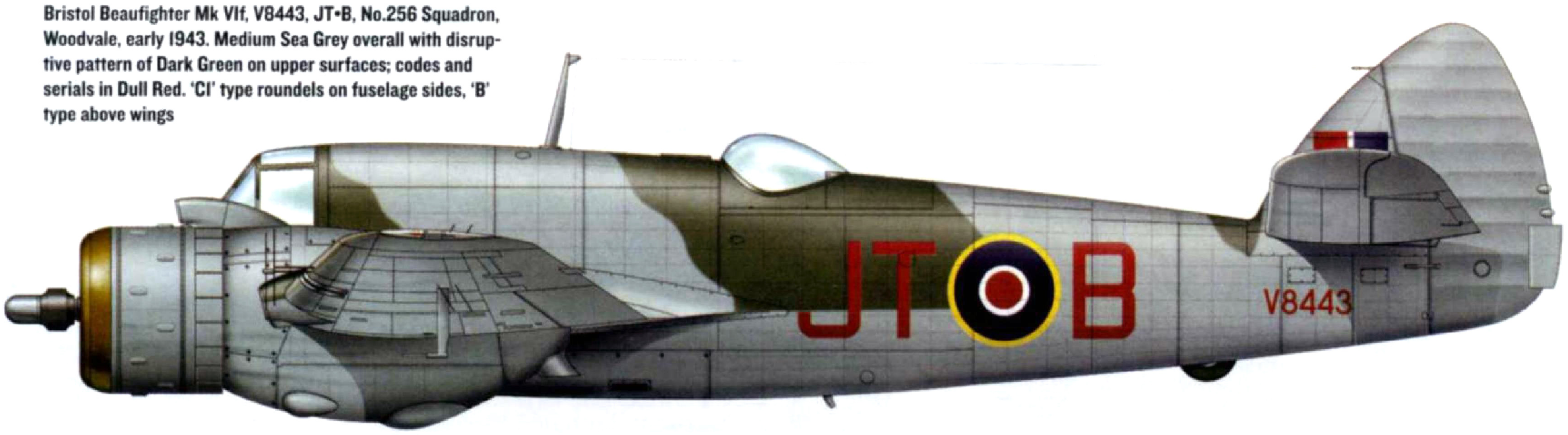
Bristol Beaufighter Mk IIf, T3370, RX•Z, No.456 Squadron, July 1942. Night overall with Dull Red codes and serials; 'CI' type roundels on fuselage sides, 'B' type above wings

Bristol Beaufighter Mk If, X7876, ZK•F, No.25 Squadron. Night overall with Dull Red codes and serials;markings changed to type 'C.I' in May 1942. 'B' type roundels above wings

Bristol Beaufighter Mk VIf, X8259, KP•U, No.409 Squadron, Coleby Grange, June 1942. Night overall with red codes and serials; 'CI' type roundel on fuselage sides, 'B' type above wings. Note earlier 49" diameter 'AI' type roundel still partially visible

Bristol Beaufighter Mk VIf, V8443, JT•B, No.256 Squadron, Woodvale, early 1943. Medium Sea Grey overall with disruptive pattern of Dark Green on upper surfaces; codes and serials in Dull Red. 'CI' type roundels on fuselage sides, 'B' type above wings

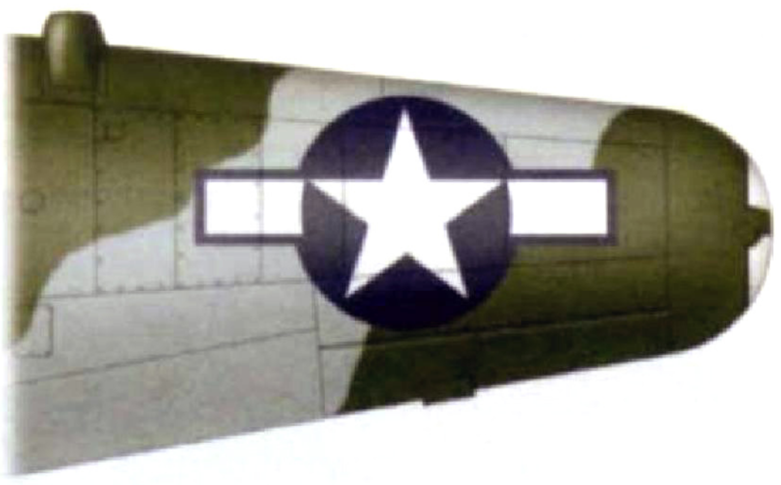


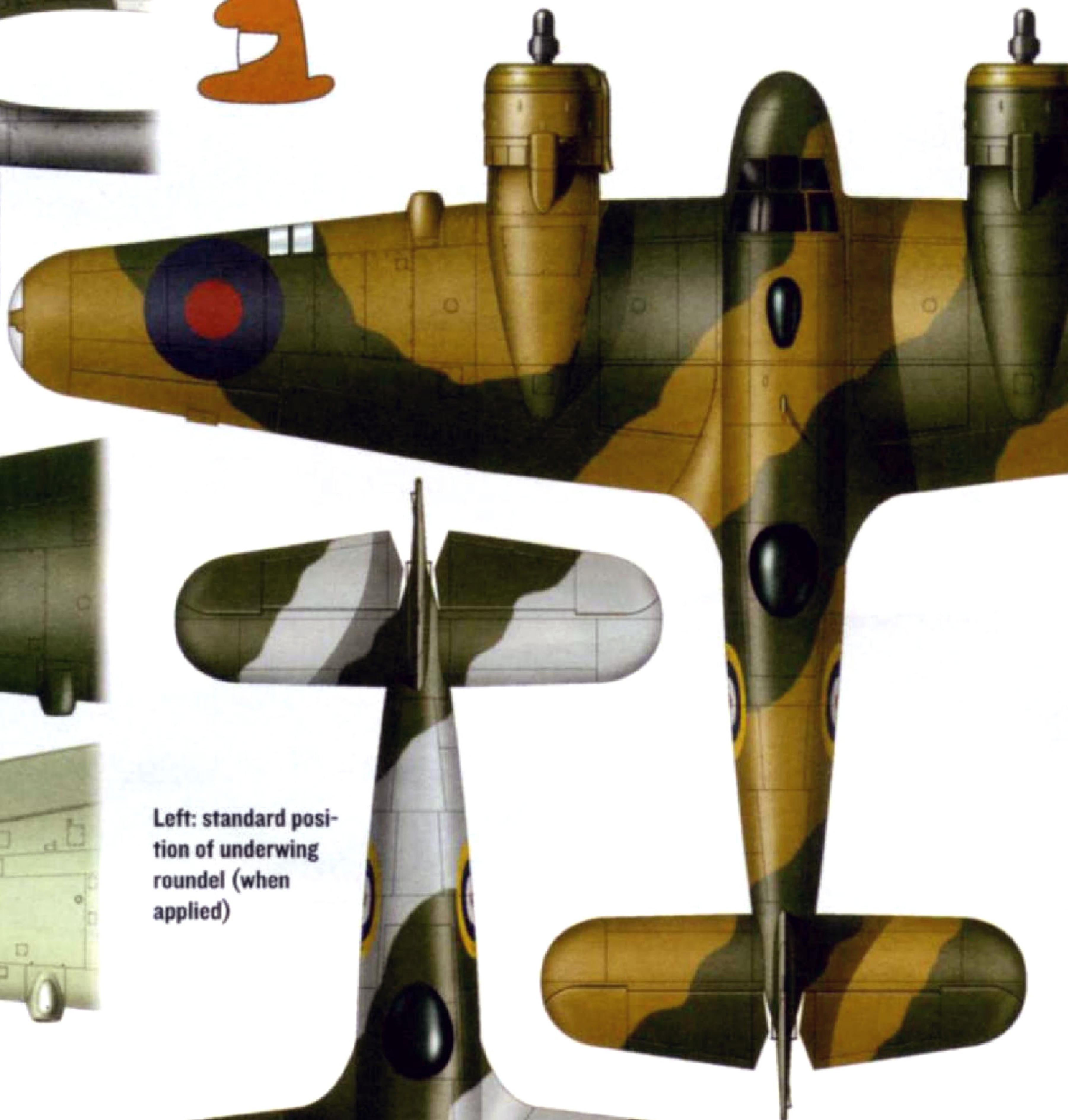
Bristol Beaufighter TF Mk X, RD367/H, No.27 Squadron, Burma, early 1943. Dark Earth/Dark/Medium Sea Grey finish. Code 'H' Medium Blue, outlined in white; white serials. White bands aroundaround wings and tail surfaces. National marking on fuselage sides and above wings in Dull Blue and Medium Blue; fin flash is in same colours

Bristol Beaufighter Mk VIf, MM850/WM•L, flown by Sqn Ldr F. Sýkora, No.68 Squadron, Coltishall, 1943. Medium Sea Grey overall with disruptive pattern in Dark Green on upper surfaces. Codes are Dull Red; serial is black. Nose detail shows nose markings

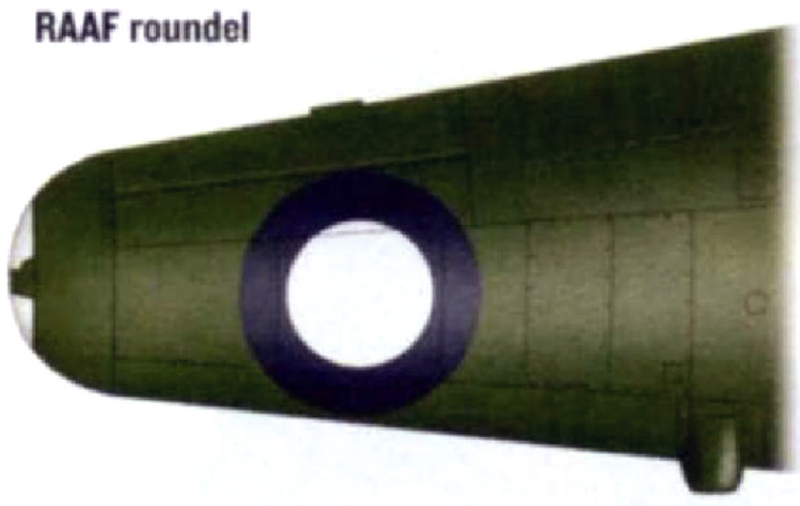
Below: Typical camouflage upper surfaces camouflage pattern in Dark Earth and Dark Green;

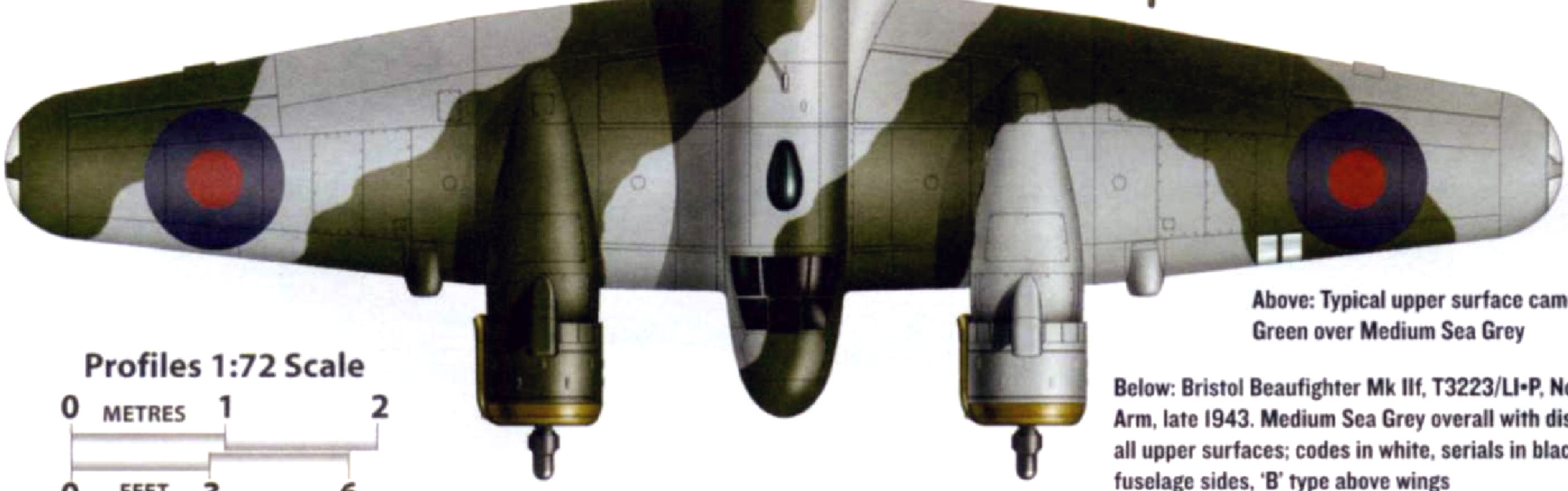
Right: position of national marking on USAAF Beaufighters (above starboard and below port wings only)



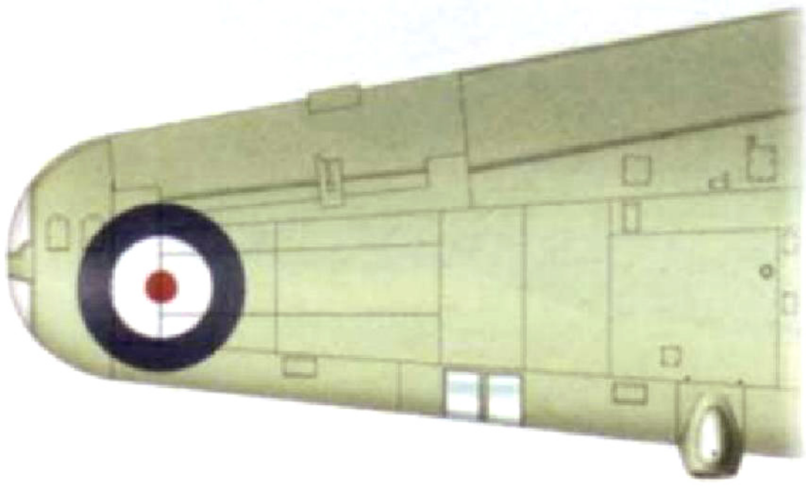


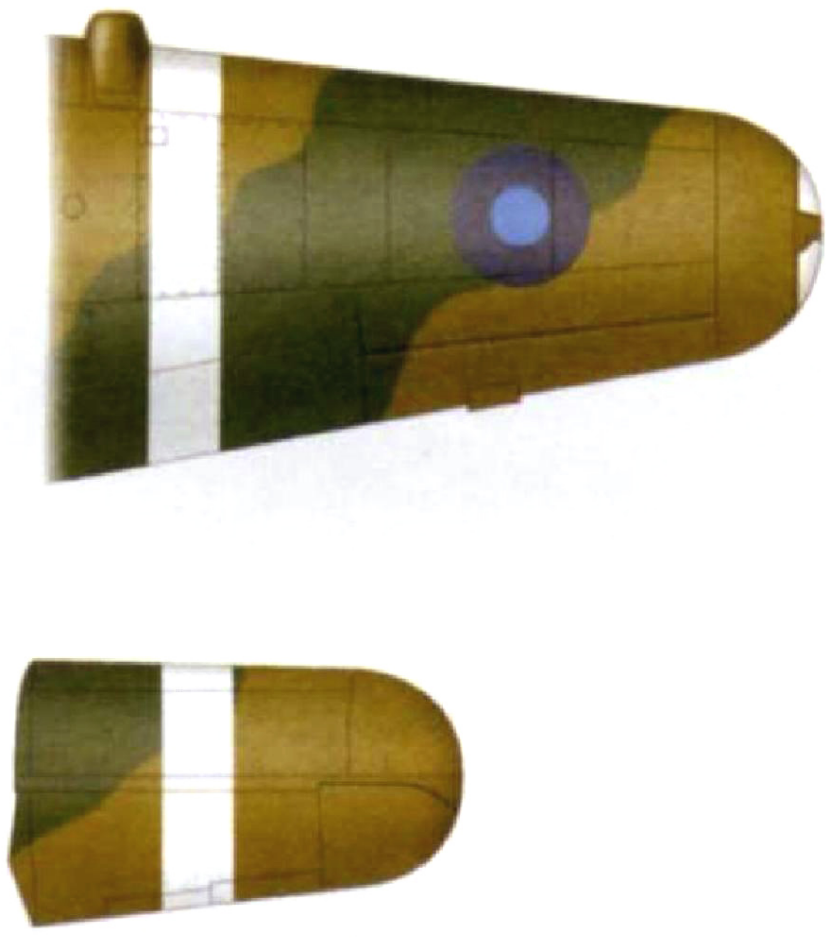
Below: Position and size of RAAF roundel





Left: standard position of underwing roundel (when applied)





Above: White band identification markings applied to Beaufighters in Burma; note position and size of Dark Blue/Medium Blue roundel

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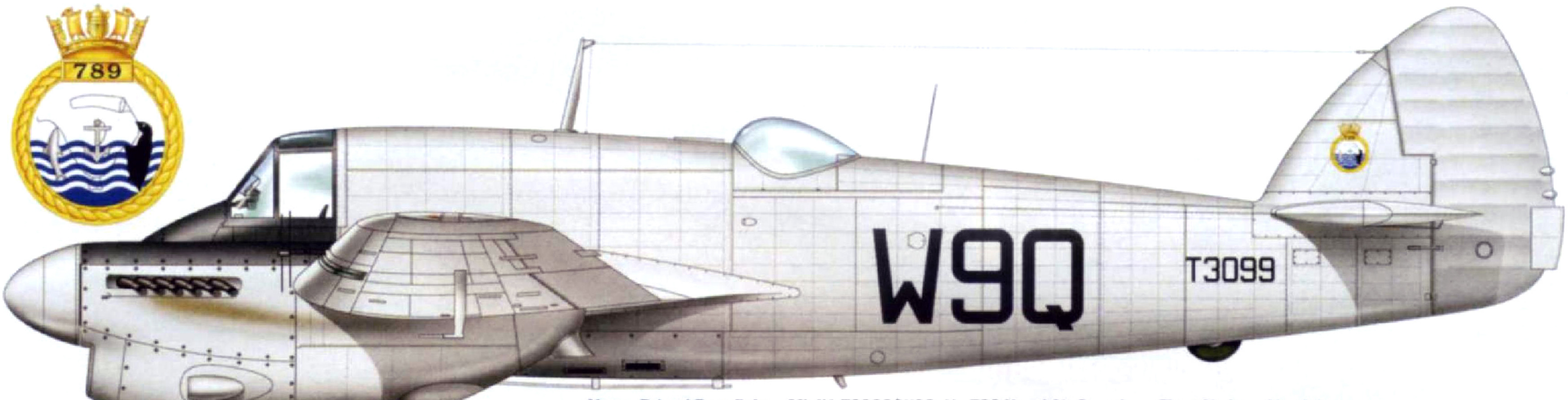
Above: Typical upper surface camouflage pattern in Dark Green over Medium Sea Grey

Profiles 1:72 Scale

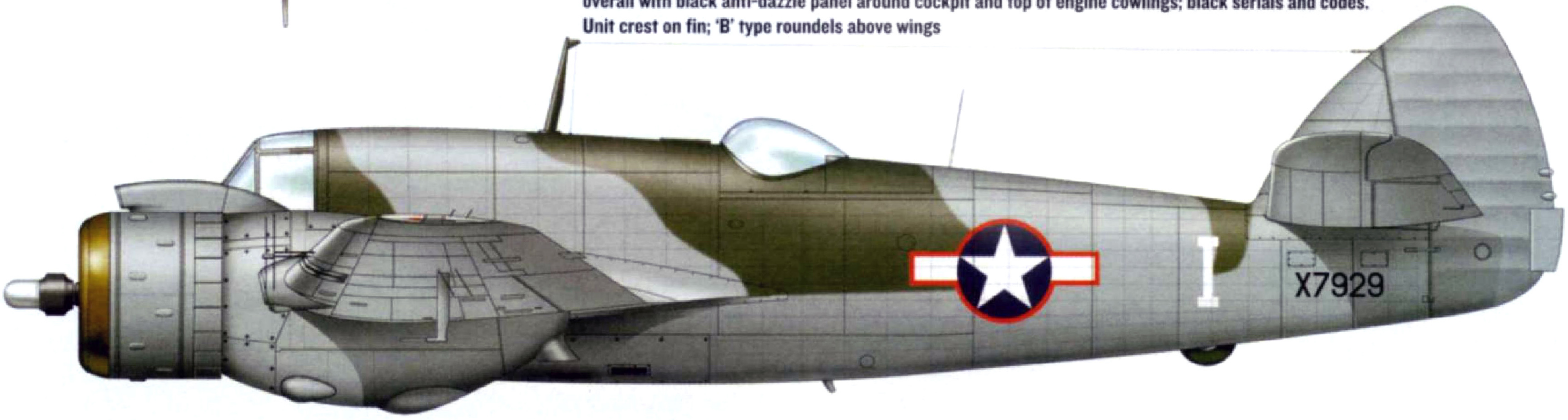
0 METRES 1 2

0 FEET 3 6

Below: Bristol Beaufighter Mk IIf, T3223/LI•P, No.798 Naval Air Squadron, Fleet Air Arm, late 1943. Medium Sea Grey overall with disruptive pattern in Dark Green on all upper surfaces; codes in white, serials in black. 'CI' type roundels on fuselage sides, 'B' type above wings

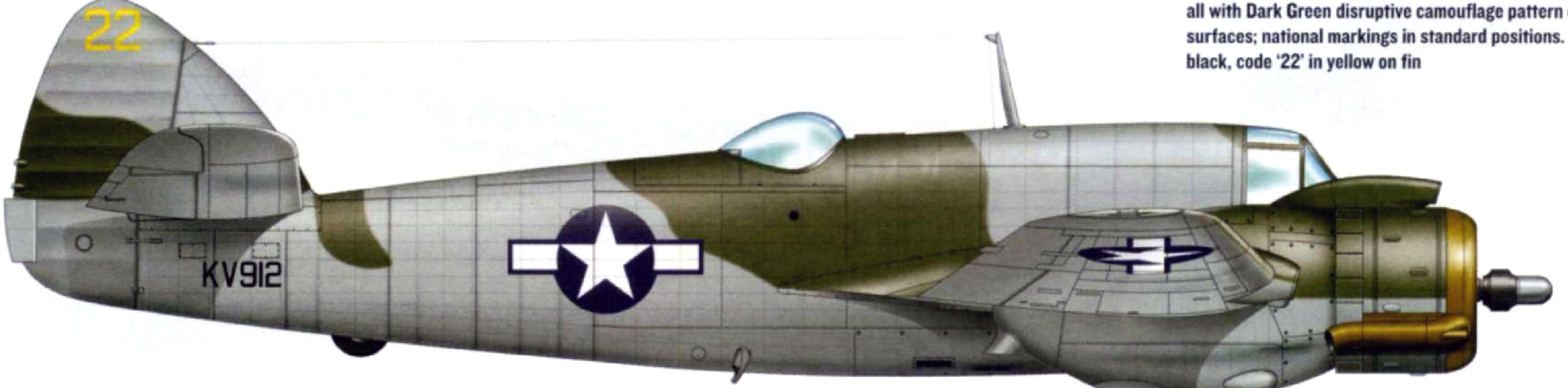


Above: Bristol Beaufighter Mk IIf, T3099/W9Q, No.789 Naval Air Squadron, Fleet Air Arm. Aluminium overall with black anti-dazzle panel around cockpit and top of engine cowlings; black serials and codes. Unit crest on fin; 'B' type roundels above wings



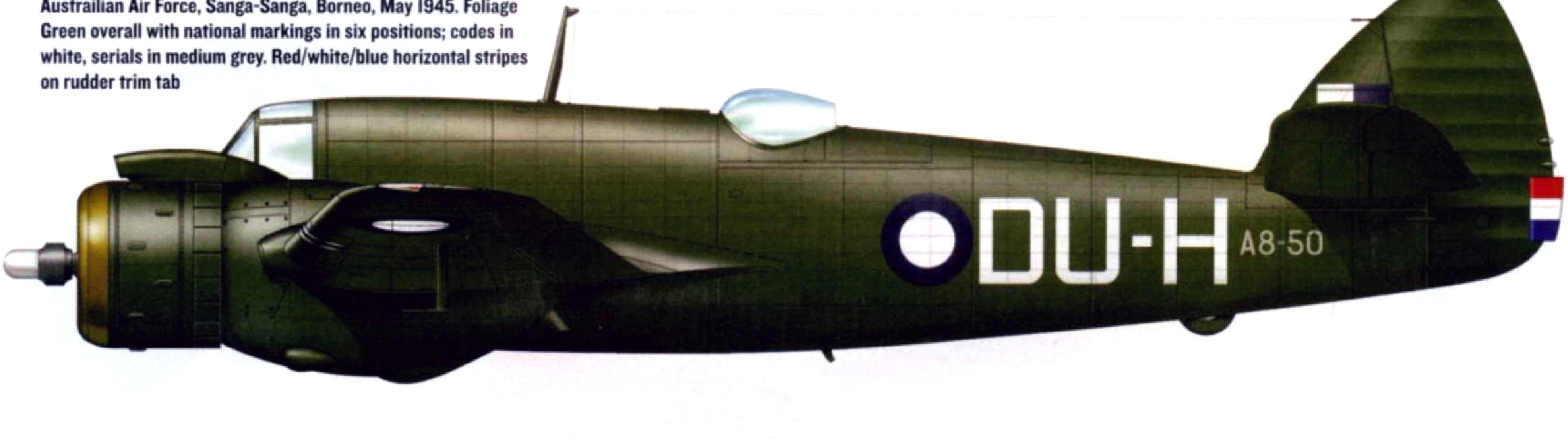
Above: Bristol Beaufighter Mk VIf, X7929/I, 416th Night Fighter Squadron, USAAF, Gerbini, 1943. Medium Sea Grey overall with Dark Green disruptive camouflage pattern on top surfaces; national markings on fuselage sides, above port and below starboard wings. Codes in white, serials in black

Below: Bristol Beaufighter Mk VIf, KV912, No.416 Night Fighter Squadron, USAAF, Italy, 1943. Mediium Sea Grey overall with Dark Green disruptive camouflage pattern on upper surfaces; national markings in standard positions. Serials in black, code '22' in yellow on fin



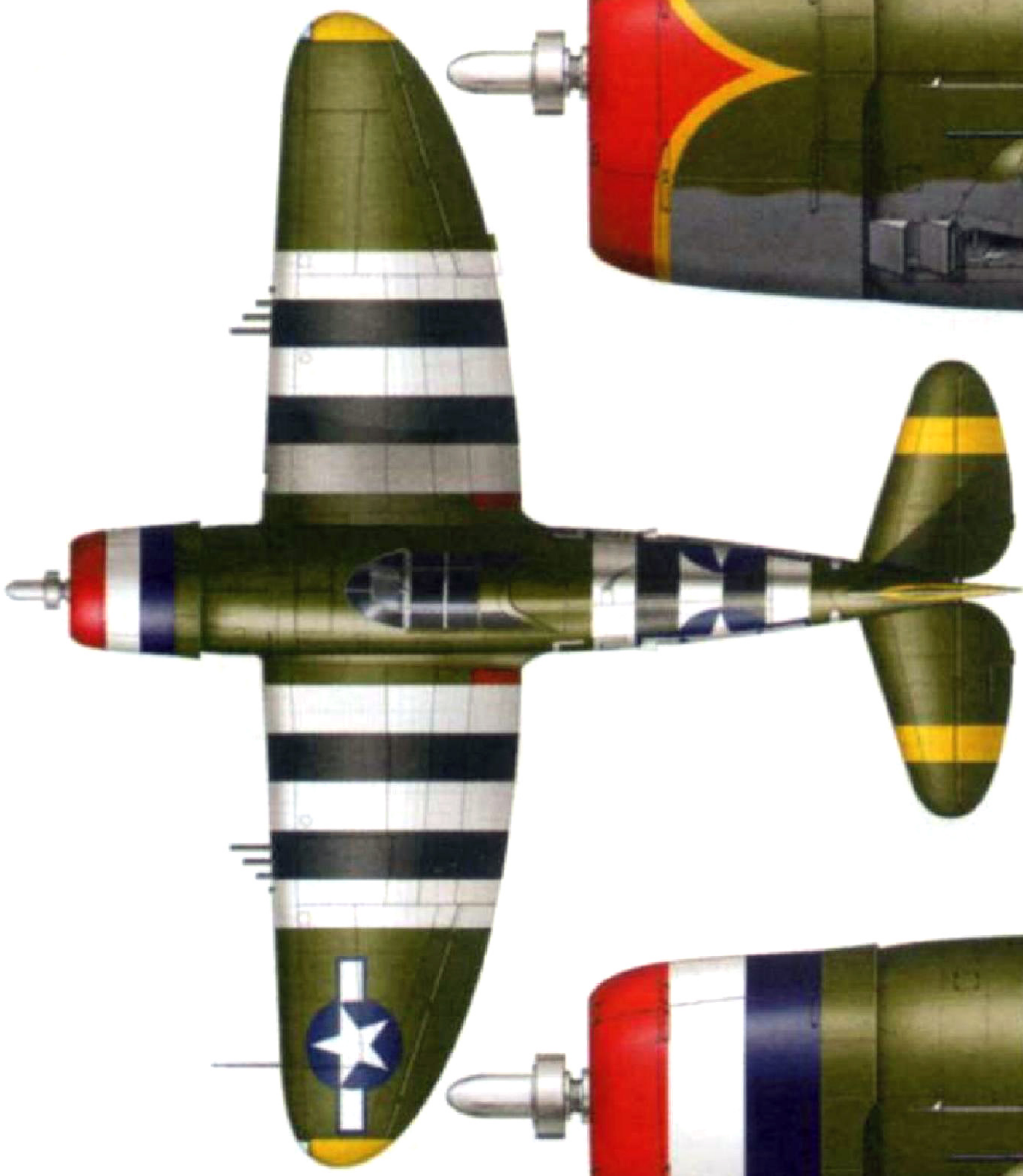
Bristol Beaufighter Mk I, A19-50/X, flown by S/Sgt Moss Morgan, No.30 Squadron, Royal Australian Air Force, Port Morseby, New Guinea, 1943. Dark Earth/Dark Green/Sky finish with blue/white roundels in six positions; serials and spinners in black. Code 'X' in white

Bristol Beaufighter Mk 21, A8-50, DU-H, No.22 Squadron, Royal Austrailian Air Force, Sanga-Sanga, Borneo, May 1945. Foliage Green overall with national markings in six positions; codes in white, serials in medium grey. Red/white/blue horizontal stripes on rudder trim tab



Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2007

P-47D-2-RA Thunderbolt, S/No.42-22529, PE-J 'Mavourneen', 328th FS, 352nd FG, 8th AF, RAF Bodney flown by Lt John Coleman. Olive Drab/Neutral Grey scheme with white front of cowling and band around fin/rudder; code is white and serial is yellow. National markings (edged in red) in six positions

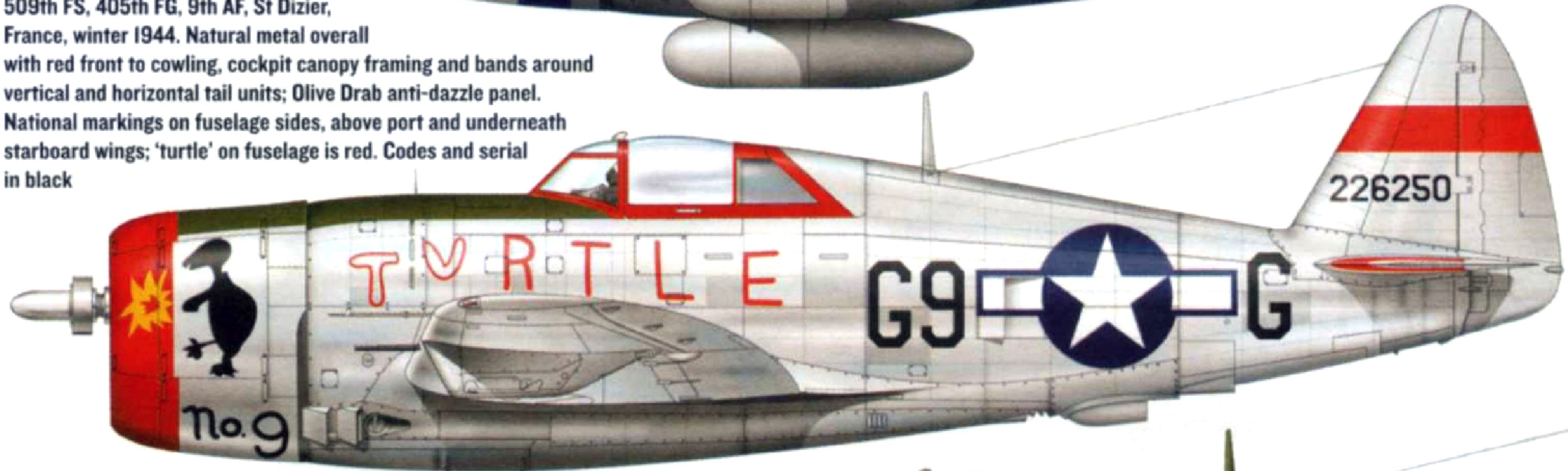


Above: P-47D Thunderbolt, 877, '52', 318th FS, 325th FG, 15th AF, Italy, spring 1944. Olive Drag/Neutral Gray scheme, with red front of cowling, edged in yellow; yellow/black checks on vertical and horizontal tail surfaces. Code is white, last three digits of serial in yellow. National markings on fuselage sides, above port and below starboard wings

Left & Below: P-47D-15-RE Thunderbolt, S/No.42-275855WW, 5F-A, 5th Emergency Rescue Squadron, 8th AF, RAF Boxted, summer 1944. Olive Drab/Neutral Grey scheme with black/white invasion stripes around fuselage and wings; Yellow band around vertical and horizontal tail surfaces, wingtips serial. Code is white, outlined in black; Insignia Red, White and Blue cowling bands. National markings in six positions; note the underwing markings overlapping over the invasion stripes and are positioned at an angle

Below: P-47D-22-RE Thunderbolt, S/No.42-26250, G9-G, 'Turtle No.9', 509th FS, 405th FG, 9th AF, St Dizier, France, winter 1944. Natural metal overall with red front to cowling, cockpit canopy framing and bands around vertical and horizontal tail units; Olive Drab anti-dazzle panel. National markings on fuselage sides, above port and underneath starboard wings; 'turtle' on fuselage is red. Codes and serial in black

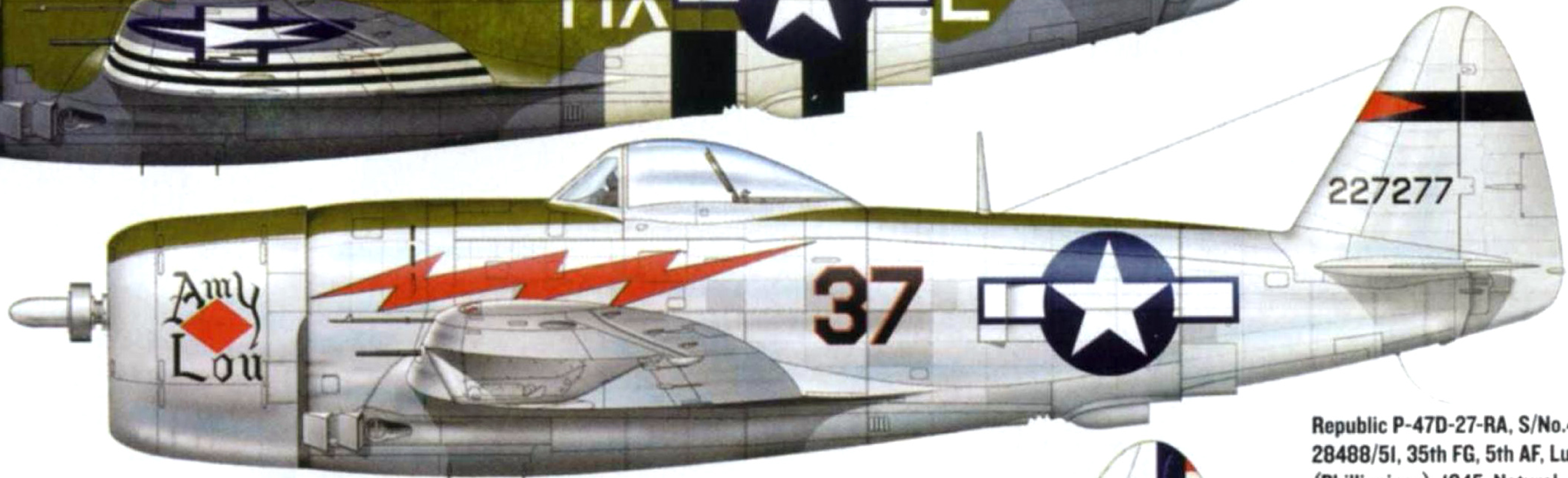
Below: P-47D-22-RE, S/No.42-26261, K4-S•, 511st FS, 405th FG, 9th AF. Olive Drab/Neutral Grey scheme with yellow front of cowling, cooling flaps, canopy framing and serial; white code. Note overpainted yellow fin/rudder band, yellow outline to rudder trim tab; fitted with a Malcolm hood. National markings on fuselage sides, above port and below starboard wings



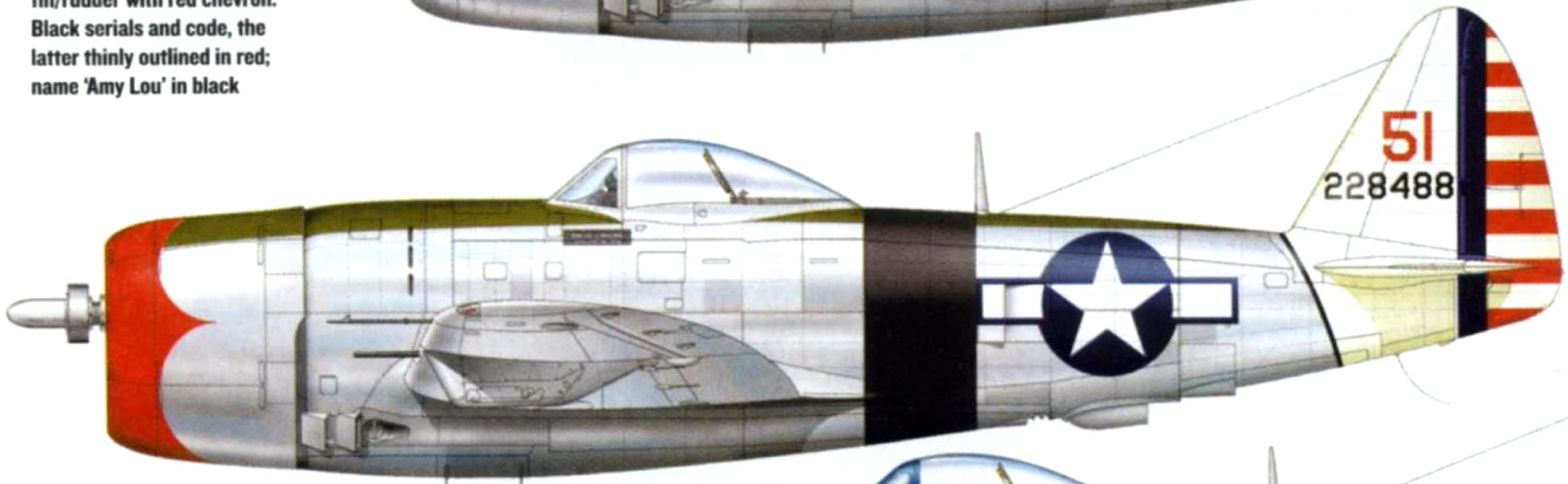
Below: Republic P-47D-22-RE, S/No.42-25828, '70', GC 2/3 Dauphiné, 1st Escadrille, based in Corsica, summer 1944. Olive Drab upper surfaces with Neutral Grey undersides; Yellow bands around wings and horizontal tail unit. French national roundels (edged in yellow) in six positions; serial in yellow, code '70' in white. Note unit badge on fuselage under the windscreen

Republic P-47D-25-RE, S/No.42-26635, MX-E, flown by Maj. Richard A. Hewitt, 82nd FS, 78th FG. Olive Drab/Neutral Grey finish with white/black bands below wings and rear fuselage; white bands around horizontal and vertical tail surfaces. Codes in white; black/white checks on cowling

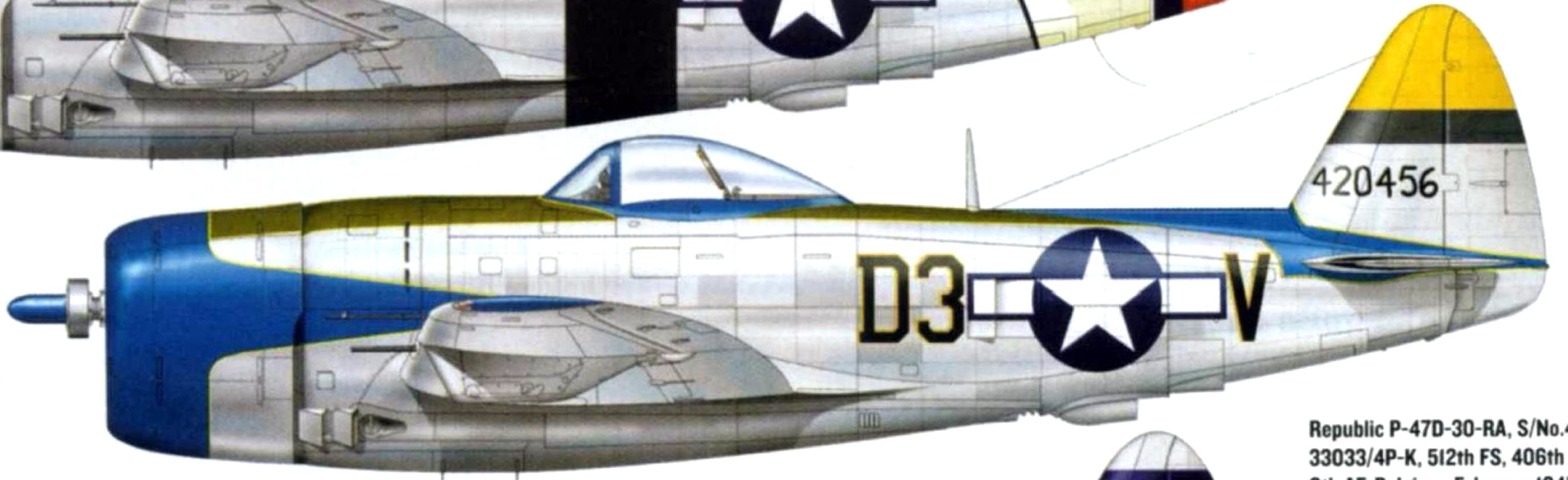
Republic P-47D-27-RE, S/No. 42-27277, 315th FS, 324th FG, 12th AF, Italy. Natural metal overall with Olive Drab anti-dazzle panel; red flash and diamond outlined in black, black band around fin/rudder with red chevron. Black serials and code, the latter thinly outlined in red; name 'Amy Lou' in black



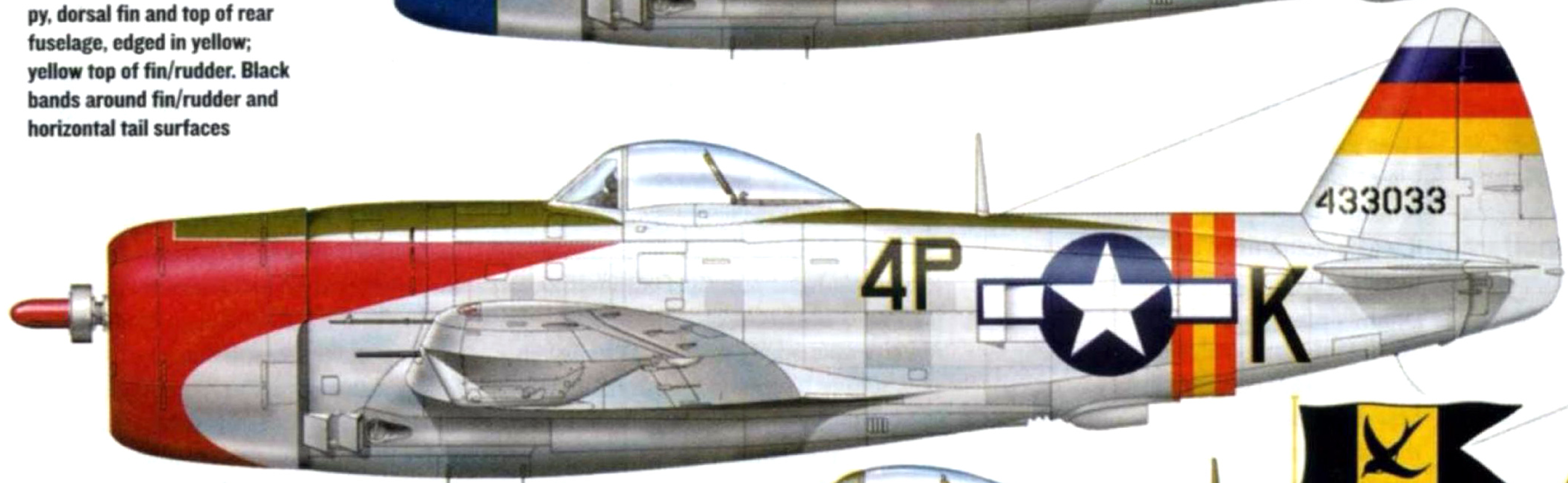
Republic P-47D-27-RA, S/No.42-28488/51, 35th FG, 5th AF, Luzon (Phillippines), 1945. Natural metal overall with Olive Drab anti-dazzle panel; red front of cowling and black band around mid-fuselage. White tail section, edged in black around fuselage; blue/white/red rudder stripes. Code in red, serial in black



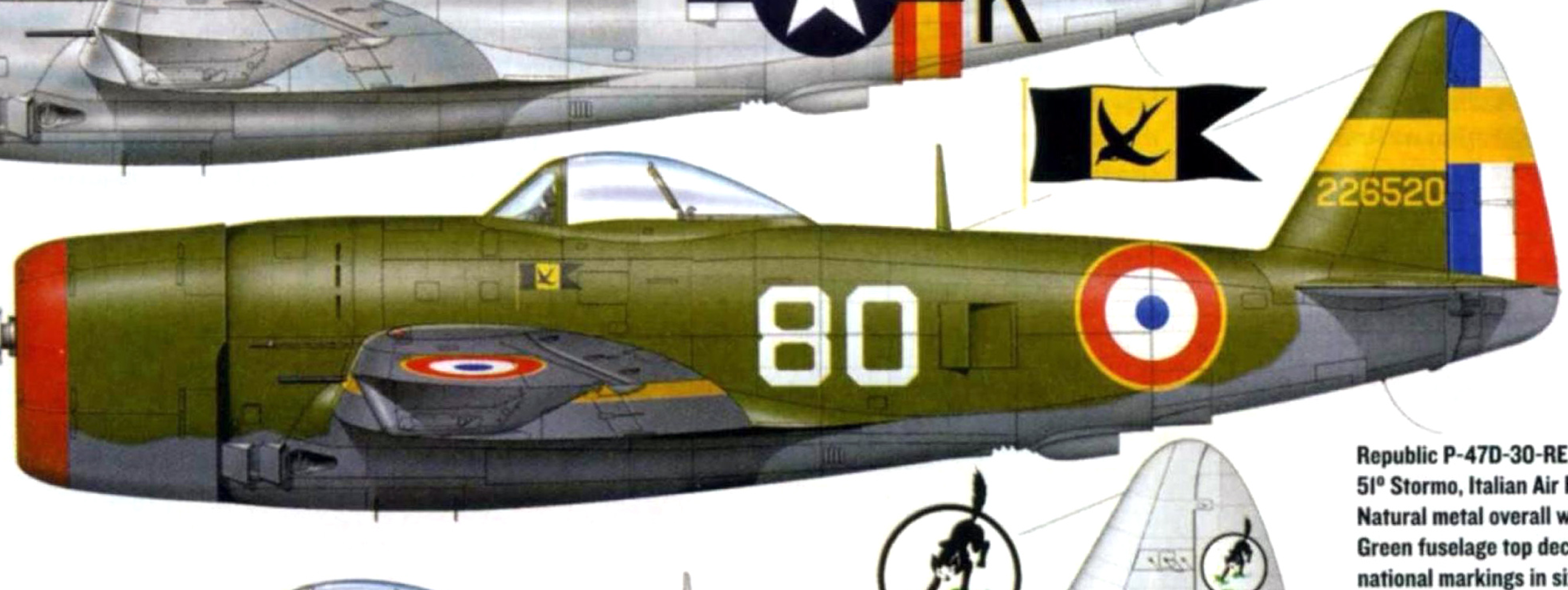
Republic P-47D-30-RE, S/No.44-20456, D3-V, 397th FS, 368th FG, 9th AF, 1946. Natural metal overall with Olive Drab fuselage top decking, edged in yellow. Mid-blue trim to nose, wingtips, canopy, dorsal fin and top of rear fuselage, edged in yellow; yellow top of fin/rudder. Black bands around fin/rudder and horizontal tail surfaces



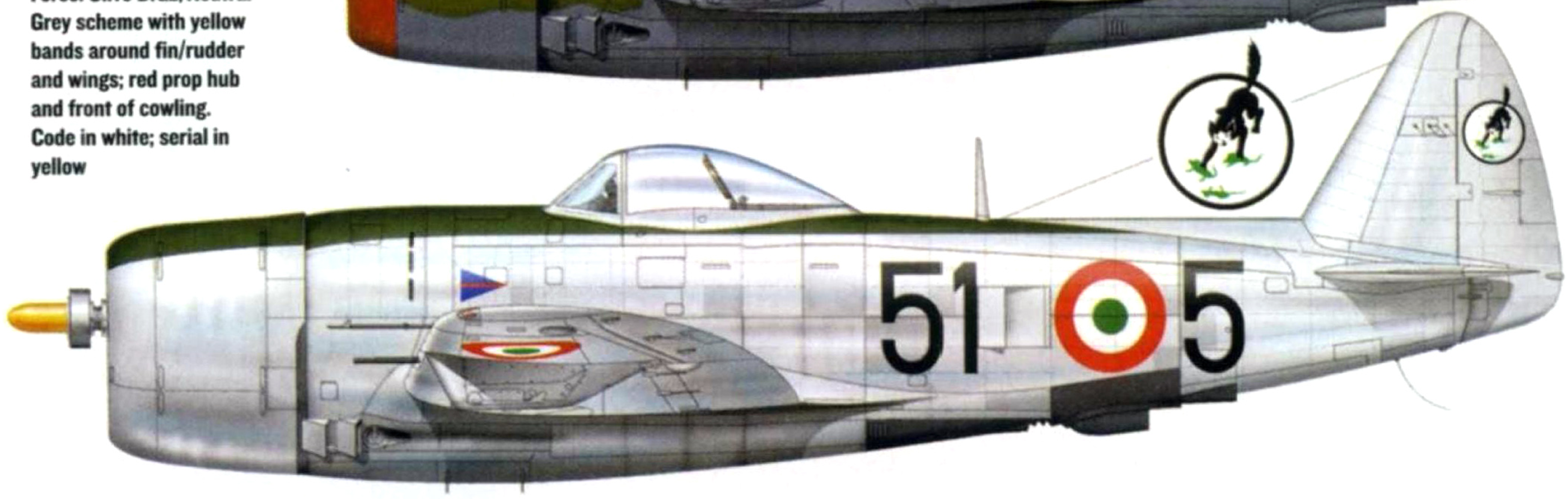
Republic P-47D-30-RA, S/No.44-33033/4P-K, 512th FS, 406th FG, 9th AF, Belgium, February 1945. Natural metal overall with red spinner and front fuselage area; red/yellow/red bands around fuselage and blue/red/yellow bands around fin/rudder. Codes in black, outlined in yellow; serial in black and anti-dazzle panel in Olive Drab



Republic P-47D-25-RE, S/No.42-26520/80, flown by the Commander of the Ie *Escadrille* of GC I/4 *Navarre*, Capt. Minot, Free French Air Force. Olive Drab/Neutral Grey scheme with yellow bands around fin/rudder and wings; red prop hub and front of cowling. Code in white; serial in yellow



Republic P-47D-30-RE, 51-5, 51º Stormo, Italian Air Force. Natural metal overall with Dark Green fuselage top decking; national markings in six positions. Code is black; spinner is yellow. Note command pennant on forward fuselage



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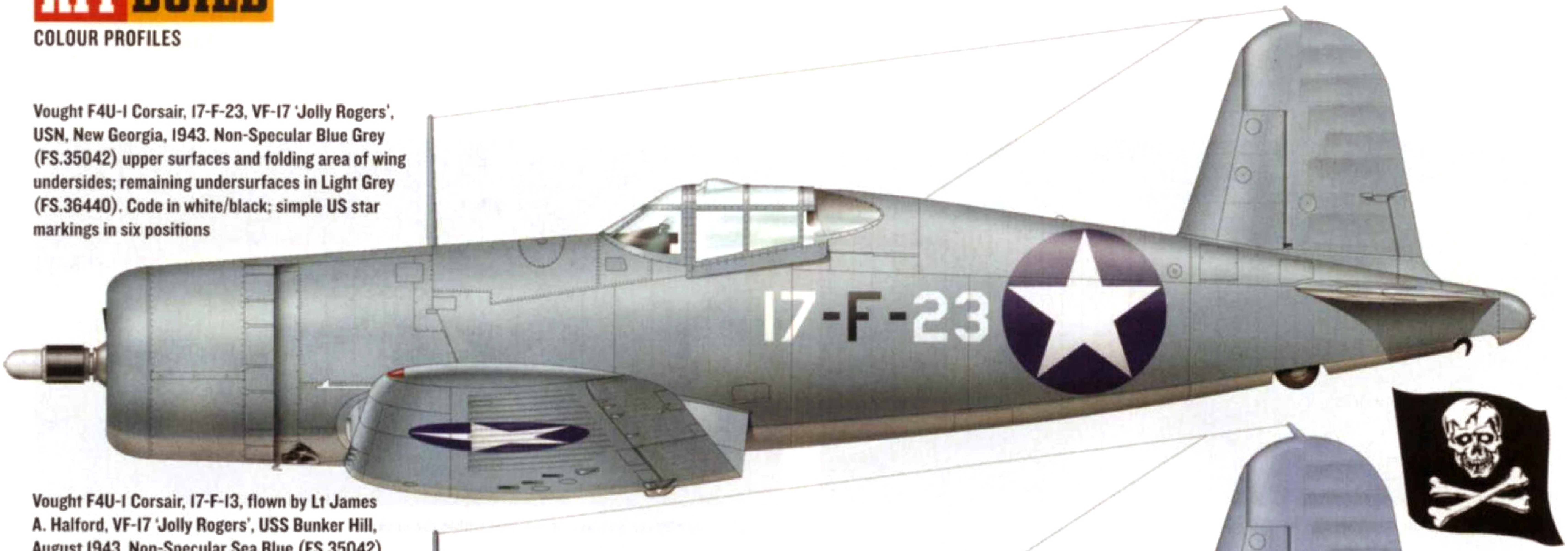
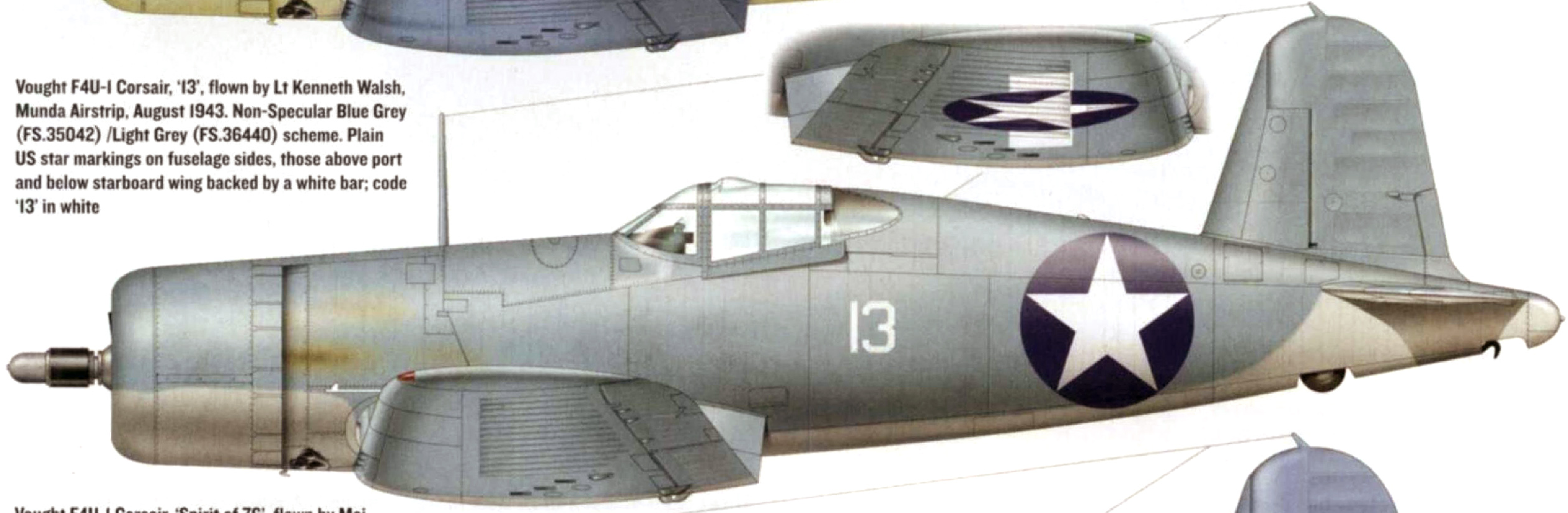
Vought F4U-1 Corsair, 17-F-23, VF-17 'Jolly Rogers', USN, New Georgia, 1943. Non-Specular Blue Grey (FS.35042) upper surfaces and folding area of wing undersides; remaining undersurfaces in Light Grey (FS.36440). Code in white/black; simple US star markings in six positions

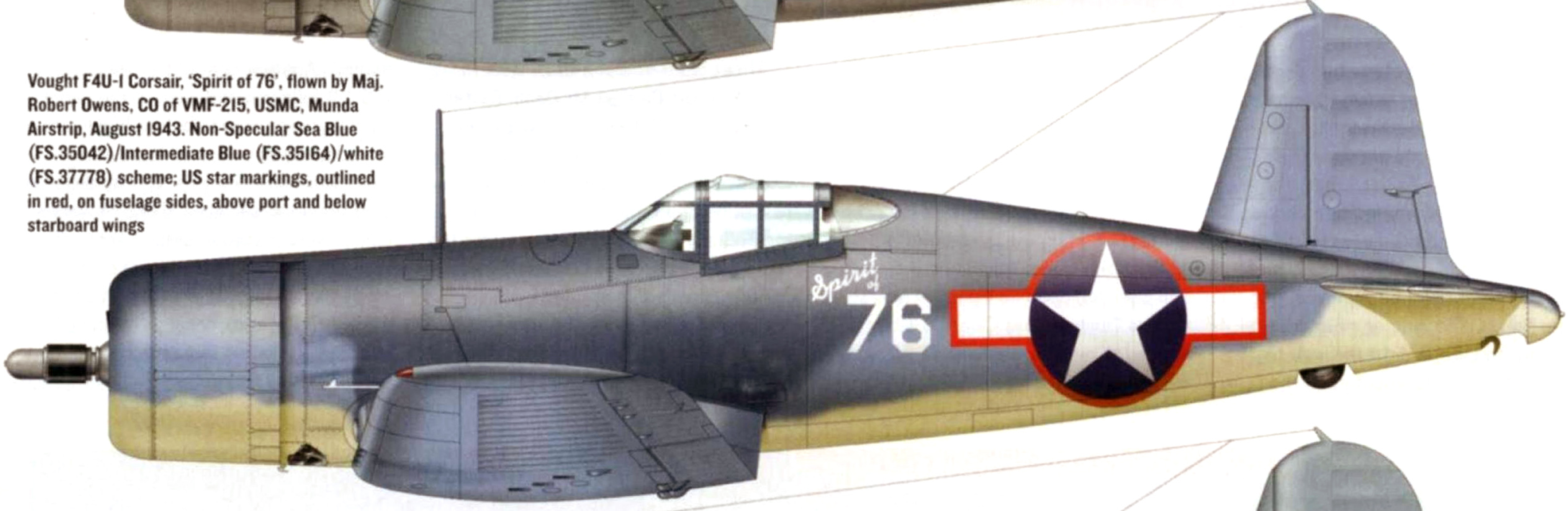


Vought F4U-1 Corsair, 17-F-13, flown by Lt James A. Halford, VF-17 'Jolly Rogers', USS Bunker Hill, August 1943. Non-Specular Sea Blue (FS.35042) and Intermediate Blue (FS.35164) with undersides in white (FS.37778); plain US national markings in six positions. 'Jolly Roger' badge on both sides of cowling, four 'victory' markings below cockpit on port side

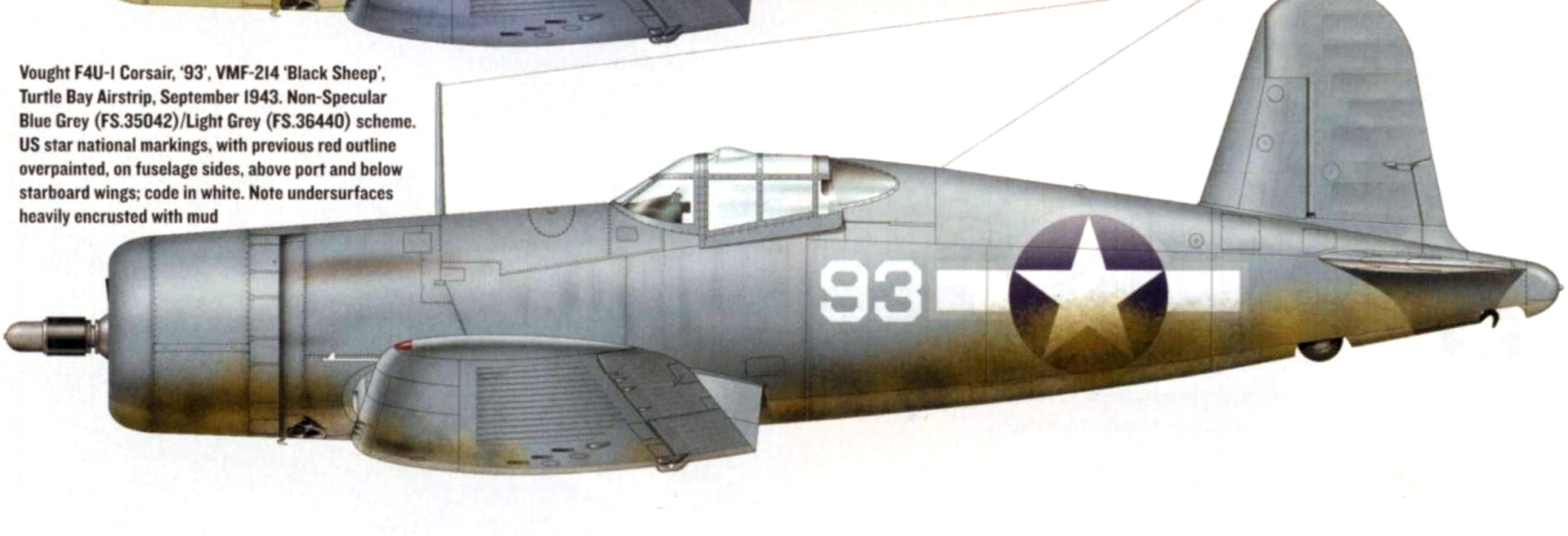
Vought F4U-1 Corsair, '13', flown by Lt Kenneth Walsh, Munda Airstrip, August 1943. Non-Specular Blue Grey (FS.35042) /Light Grey (FS.36440) scheme. Plain US star markings on fuselage sides, those above port and below starboard wing backed by a white bar; code '13' in white



Vought F4U-1 Corsair, 'Spirit of 76', flown by Maj. Robert Owens, CO of VMF-215, USMC, Munda Airstrip, August 1943. Non-Specular Sea Blue (FS.35042)/Intermediate Blue (FS.35164)/white (FS.37778) scheme; US star markings, outlined in red, on fuselage sides, above port and below starboard wings



Vought F4U-1 Corsair, '93', VMF-214 'Black Sheep', Turtle Bay Airstrip, September 1943. Non-Specular Blue Grey (FS.35042)/Light Grey (FS.36440) scheme. US star national markings, with previous red outline overpainted, on fuselage sides, above port and below starboard wings; code in white. Note undersurfaces heavily encrusted with mud



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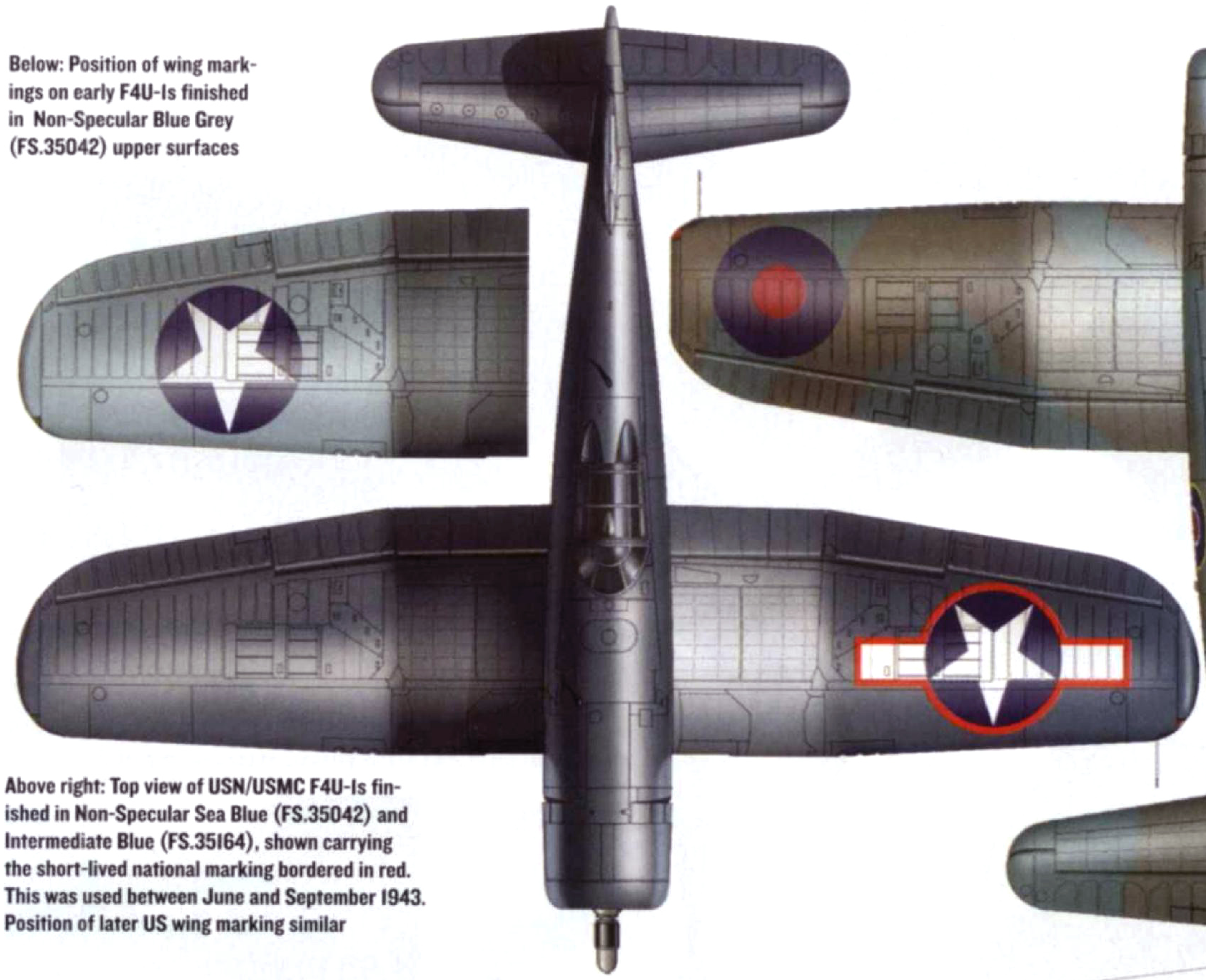
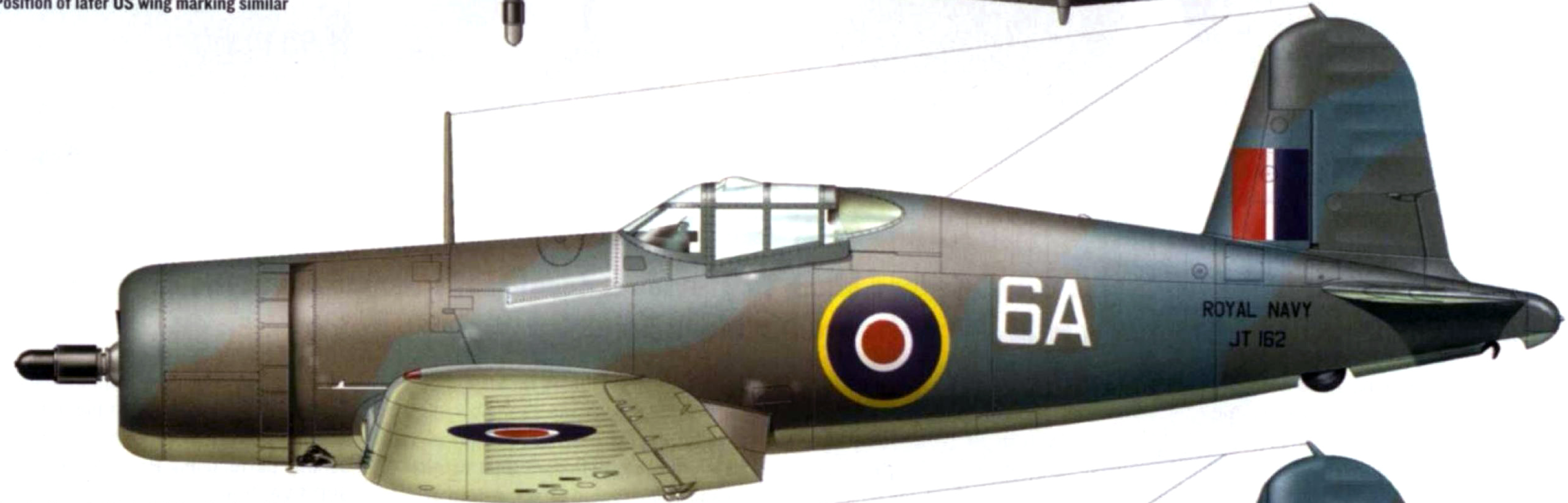
Original Artwork by Richard J. Caruana © MAI 2007

Below: Position of wing markings on early F4U-Is finished in Non-Specular Blue Grey (FS.35042) upper surfaces

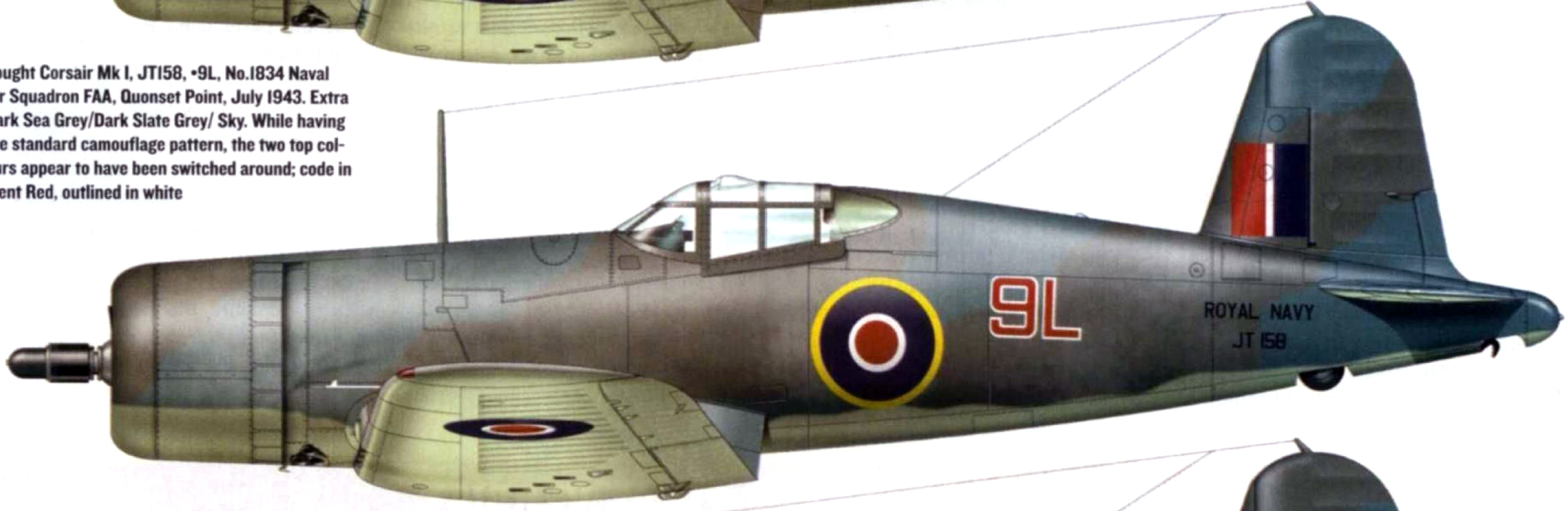


Above right: Top view of USN/USMC F4U-Is finished in Non-Specular Sea Blue (FS.35042) and Intermediate Blue (FS.35164), shown carrying the short-lived national marking bordered in red. This was used between June and September 1943. Position of later US wing marking similar

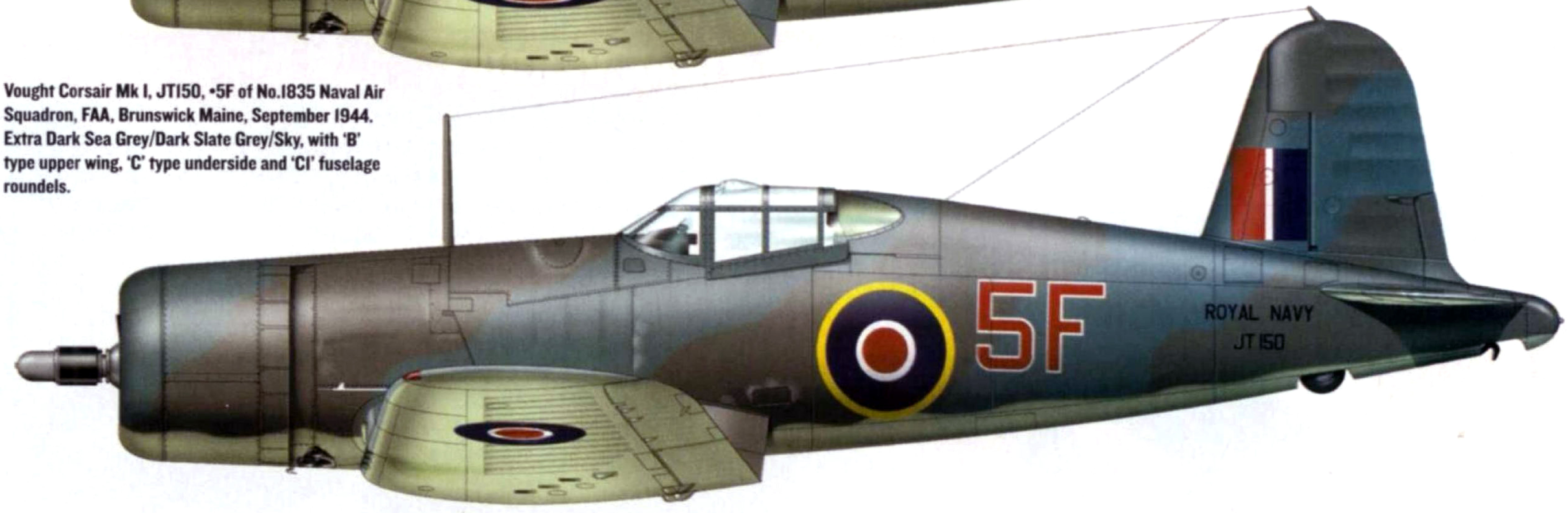
Below: Vought Corsair Mk I, JT162, •6A, No.1830 Naval Air Squadron FAA, the first unit to be formed on this type at Quonset Point in June 1943. Extra Dark Sea Grey/Dark Slate Grey/Sky with 'B' type roundels above wings, 'C' under and 'CI' on fuselage. Code '6A' in white over patched up previous identity; a common feature on FAA aircraft is the gap between letters and numerals within the serial. FAA top surface camouflage pattern is shown at left; note clipped wingtips on FAA Corsairs



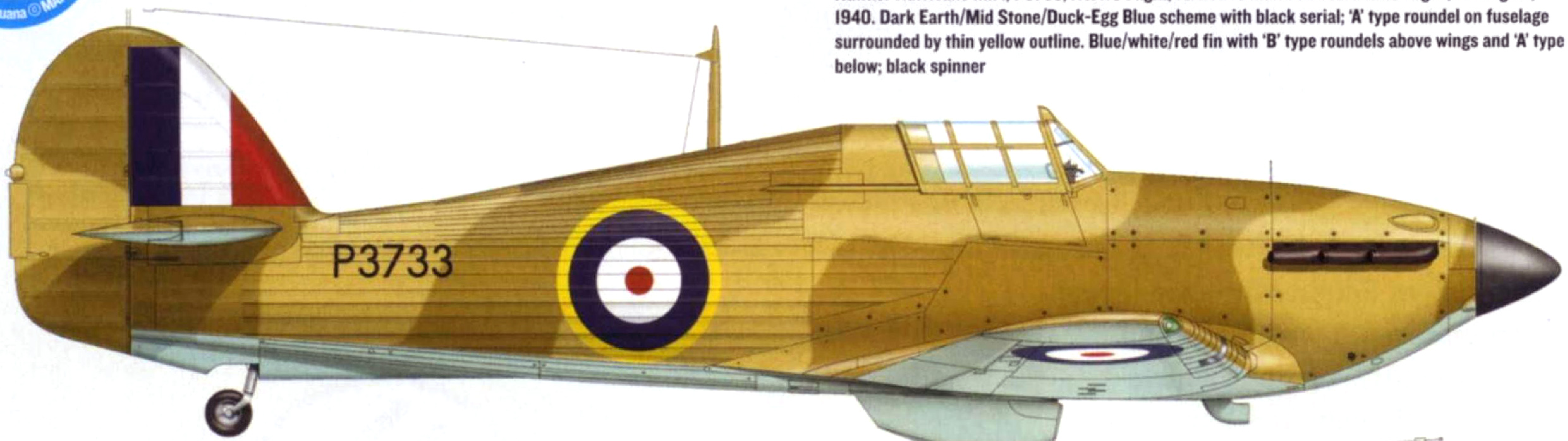
Vought Corsair Mk I, JT158, •9L, No.1834 Naval Air Squadron FAA, Quonset Point, July 1943. Extra Dark Sea Grey/Dark Slate Grey/ Sky. While having the standard camouflage pattern, the two top colours appear to have been switched around; code in Ident Red, outlined in white



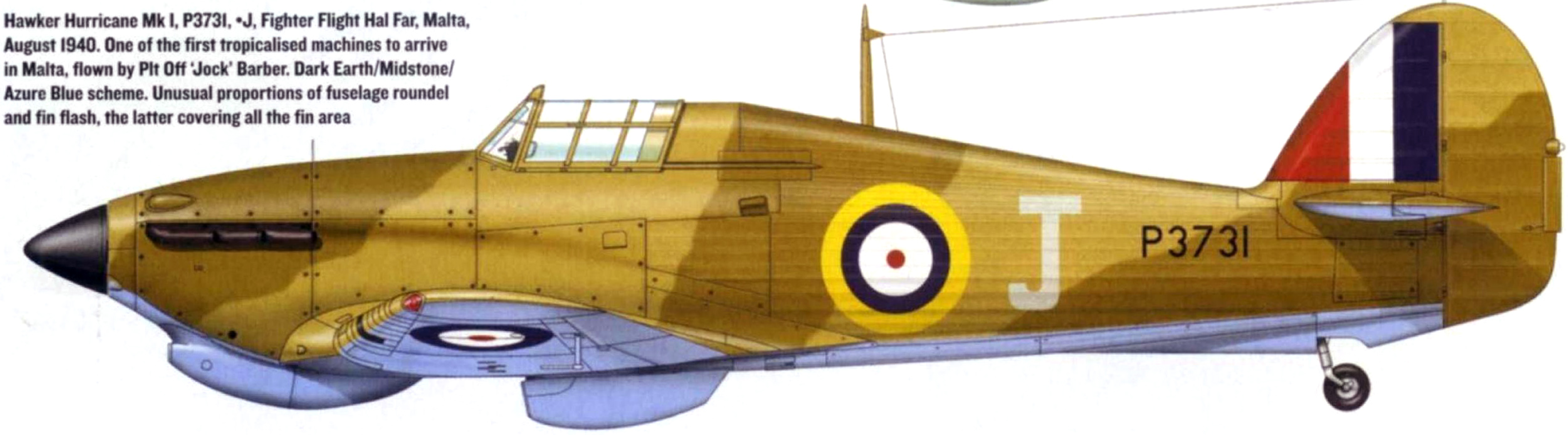
Vought Corsair Mk I, JT150, •5F of No.1835 Naval Air Squadron, FAA, Brunswick Maine, September 1944. Extra Dark Sea Grey/Dark Slate Grey/Sky, with 'B' type upper wing, 'C' type underside and 'CI' fuselage roundels.



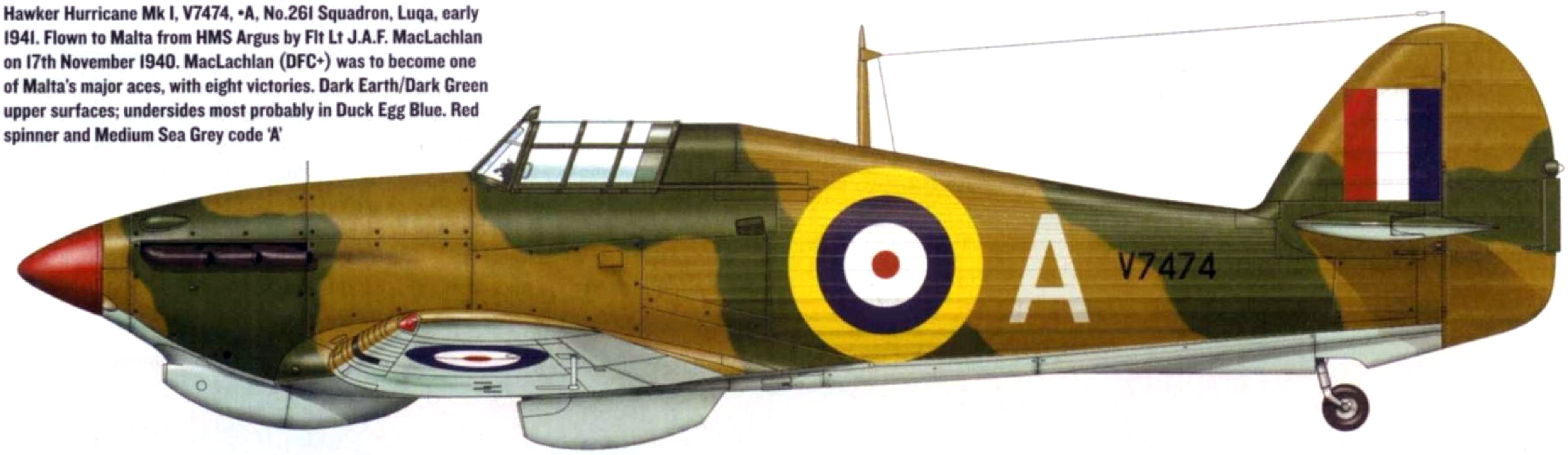
Hawker Hurricane Mk I, N2673, No.418 Flight, Hal Far. One of the first batch of Hurricanes flown to Malta from HMS Argus on 30th July, 1940 by Flt Lt A.J. Trumble. Dark Earth/Dark Green upper surfaces with white/Night undersides. Note yellow surround to roundel under port wing only



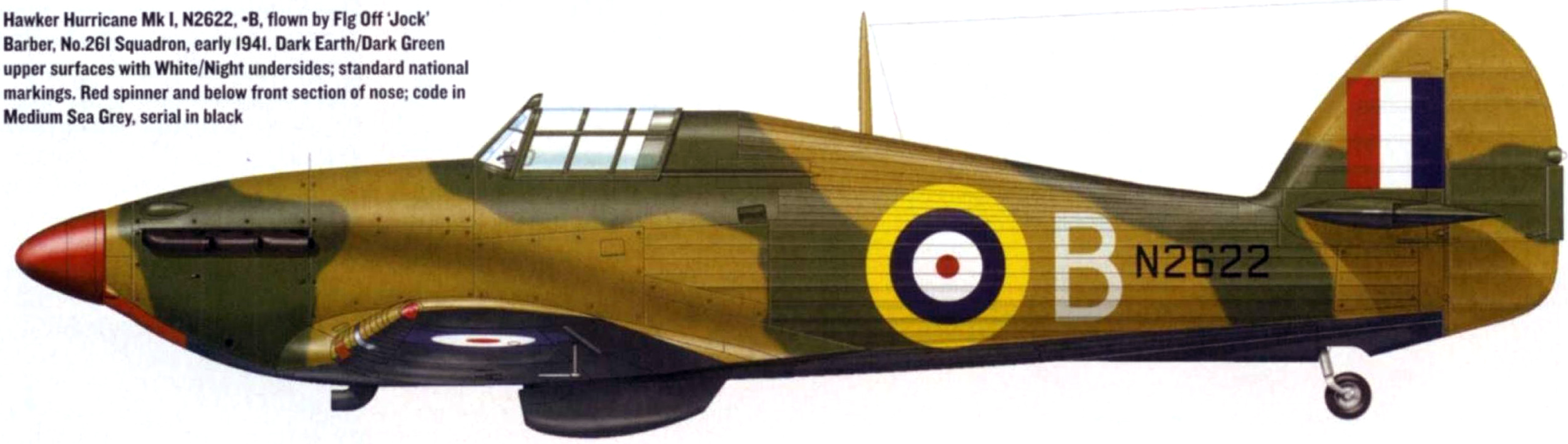
Hawker Hurricane Mk I, P3733, No.418 Flight, ferried to Malta on board HMS Argus, 1st August, 1940. Dark Earth/Mid Stone/Duck-Egg Blue scheme with black serial; 'A' type roundel on fuselage surrounded by thin yellow outline. Blue/white/red fin with 'B' type roundels above wings and 'A' type below; black spinner



Hawker Hurricane Mk I, P3731, •J, Fighter Flight Hal Far, Malta, August 1940. One of the first tropicalised machines to arrive in Malta, flown by Plt Off 'Jock' Barber. Dark Earth/Midstone/Azure Blue scheme. Unusual proportions of fuselage roundel and fin flash, the latter covering all the fin area



Hawker Hurricane Mk I, V7474, •A, No.261 Squadron, Luqa, early 1941. Flown to Malta from HMS Argus by Flt Lt J.A.F. MacLachlan on 17th November 1940. MacLachlan (DFC+) was to become one of Malta's major aces, with eight victories. Dark Earth/Dark Green upper surfaces; undersides most probably in Duck Egg Blue. Red spinner and Medium Sea Grey code 'A'



Hawker Hurricane Mk I, N2622, •B, flown by Flg Off 'Jock' Barber, No.261 Squadron, early 1941. Dark Earth/Dark Green upper surfaces with White/Night undersides; standard national markings. Red spinner and below front section of nose; code in Medium Sea Grey, serial in black

WRITTEN BY RICHARD J. CARUANA

HURRICANES IN MALTA'S DEFENCE

To mark the 12th anniversary of Richard A. Franks and Richard J. Caruana's collaboration, we take a new look at the subject of their very first published article

At the time of the serious opening shots of the Battle of Britain, the Royal Air Force (RAF), barely prepared for an air conflict of such importance, needed every single fighter aircraft available if Britain was to survive. Even though the Hurricane Mk I was on the brink of retirement it would eventually be the type that bore the brunt of that Battle. However, fighter aircraft were badly needed elsewhere and Malta was no exception. On Italy's declaration of war against the Allies on 10th June 1940, the Island's only fighter aircraft defence was made up of a small group of Gloster Sea Gladiators, hardly adequate in fighting off a much better equipped Regia Aeronautica, not to mention the later intervention of the Luftwaffe. No Spitfires would be available for service outside Britain for nearly two more years; until then, it was the Hurricane that had to come to Malta's defence.

The first pair of Hurricanes arrived at Malta early on 21st June 1940 accompanied by a Hudson flown by Fg Off. G.V.W. Davies; another pair landed at 13:00, accompanied by three Blenheims. These aircraft were en-route to Alexandria from Medjez, in Tunisia, and formed a small part of the whole delivery, which actually consisted of eight aircraft. Two more arrived in the afternoon and the last pair, which had experienced considerable technical problems, arrived after sunset. Two Hurricanes were damaged by adventures encountered in Tunisia; the one flown by Plt Off. R.H. Barber had to be fitted with a makeshift tailskid when the original tailwheel was lost at Marignane.

The sight of eight Hurricane Mk Is alongside the aging Gloster Sea Gladiators was too tempting for Air Commodore Maynard, and his intervention with Air Chief Marshal Sir Arthur Longmore, Air Officer Commander-in-Chief Middle East, to keep some of them on the Island was accepted. Five were detailed to stay on, consisting of Hurricanes P2614, 2623, 2629, 2645 and 2653 together with their pilots: Fg Off. Taylor, Plt Off. Barber, Plt Off. A.G. McAdam, Plt Off. Balmforth and Plt Off. W.R.C. Sugden. The Hudson, crewed by Fg Off. Davies and Flt Lt Cooper, was also kept at Malta and was to be used for a number of reconnaissance flights.

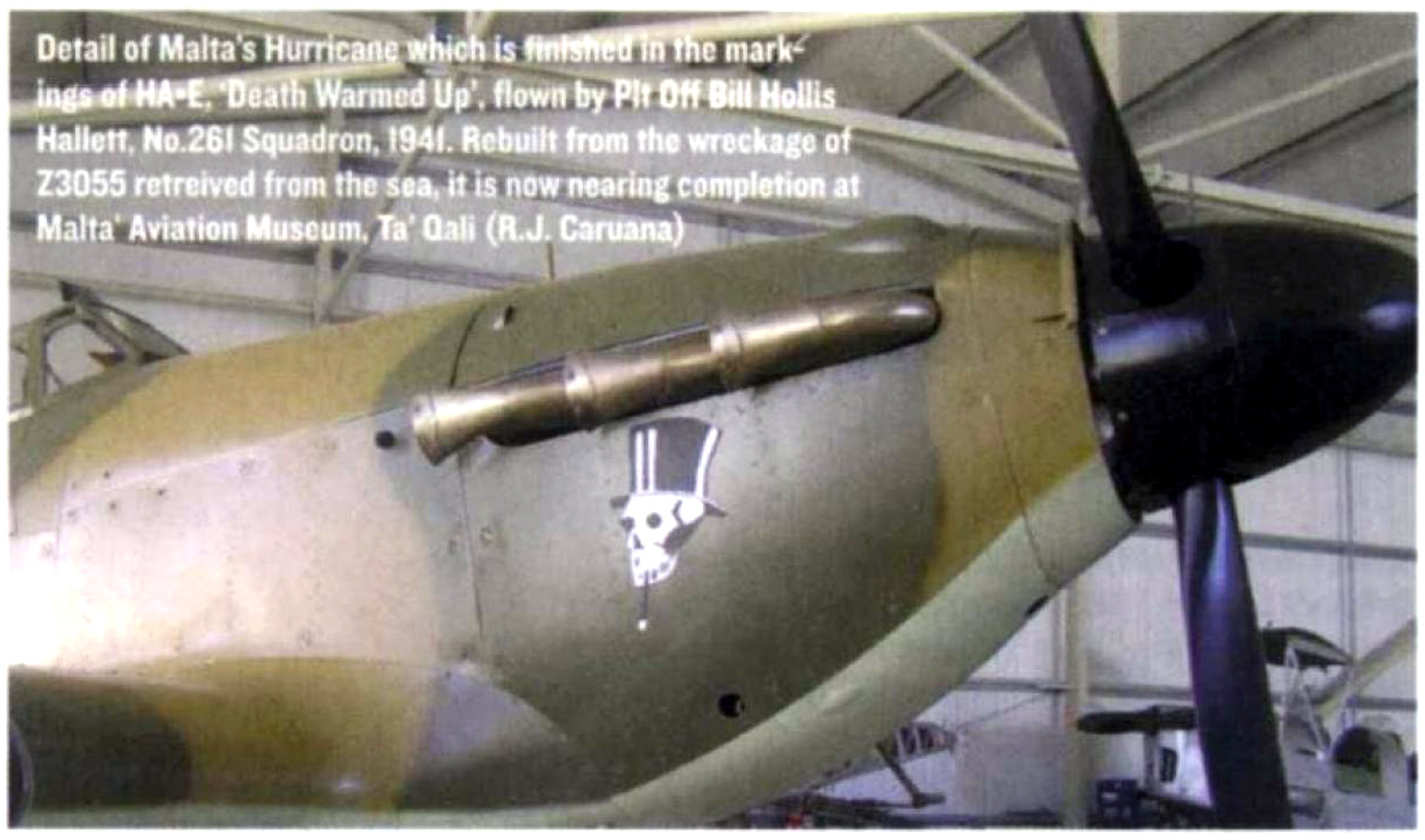
These aircraft boosted the island's morale and contributed towards alleviating the Gladiators' burden. However it was a Gladiator that scored the first victory for Malta's defenders on 22nd June. Six days later Fighter Flight Malta (as the combined Sea Gladiator/Hurricane unit became known) moved from Hal Far to Luqa, a newly constructed airfield with three paved runways.

Ironically, the Hurricane – intended to replace the biplanes in RAF service – received its baptism of fire over Malta facing the Fiat CR.42. The agile Italian biplane was no easy target, however. On 3rd July, a Hurricane flown by Fg Off. Waters chased and shot a Savoia Marchetti SM.79 only to be hit by an escorting CR.42. Waters crash landed his aircraft, writing it off, without sustaining serious injury. The following day a formidable force of Fiat CR.42s from Comiso (Sicily) performed an all-out effort to wipe out the small defensive force on the ground. Their spectacular low level strafing of Hal Far, however, only resulted in damaging a pair of Swordfish.

On 7th July, during a raid on the dock area by S.79s escorted by CR.42s, Woods managed to shoot down a bomber from 233ª Squadriglia. Three days later Woods brought down another SM.79 in flames whilst Hartley managed to seriously damage another, which barely made it back to base.

On 16th July Flt Lt Burges and Flt Lt Keeble met a very strong force of CR.42s. Keeble (flying P2632) was hit and crashed to his death a hundred metres away from the wreckage of a CR.42 that he had shot down a few moments earlier, claiming the life of its pilot, Ten Mario Benedetti. This was the loss of Malta's first pilot. By that time the Hurricanes were showing signs of weariness; no spares for these aircraft were available on the island and their condition deteriorated daily. It became imperative to send more Hurricanes to Malta.

Operation Railway I: the scene aboard HMS Ark Royal as Hurricanes of No.249 Squadron are ferried to Malta. The final lap to Ta' Qali was flown off the carrier at extreme range (R.J. Caruana Archvies)



Detail of Malta's Hurricane which is finished in the markings of HA-E, 'Death Warmed Up', flown by Plt Off Bill Hollis Hallett, No.261 Squadron, 1941. Rebuilt from the wreckage of Z3055 retreived from the sea, it is now nearing completion at Malta' Aviation Museum, Ta' Qali (R.J. Caruana)

OPERATION 'HURRY'

The delivery of the first twelve Hurricanes specially destined for Malta bore enormous significance. It indicated a change of policy at the War Office after a half-hearted start; the Chiefs of Staff now considered the Island vital in the fight for supremacy of the Mediterranean, especially in cutting off Axis supplies from Europe – particularly Southern Italy and Sicily – to North Africa. Operation Hurry's importance was such that it was shrouded in great secrecy. Flt Lt A.J. Trumble recounts the events:

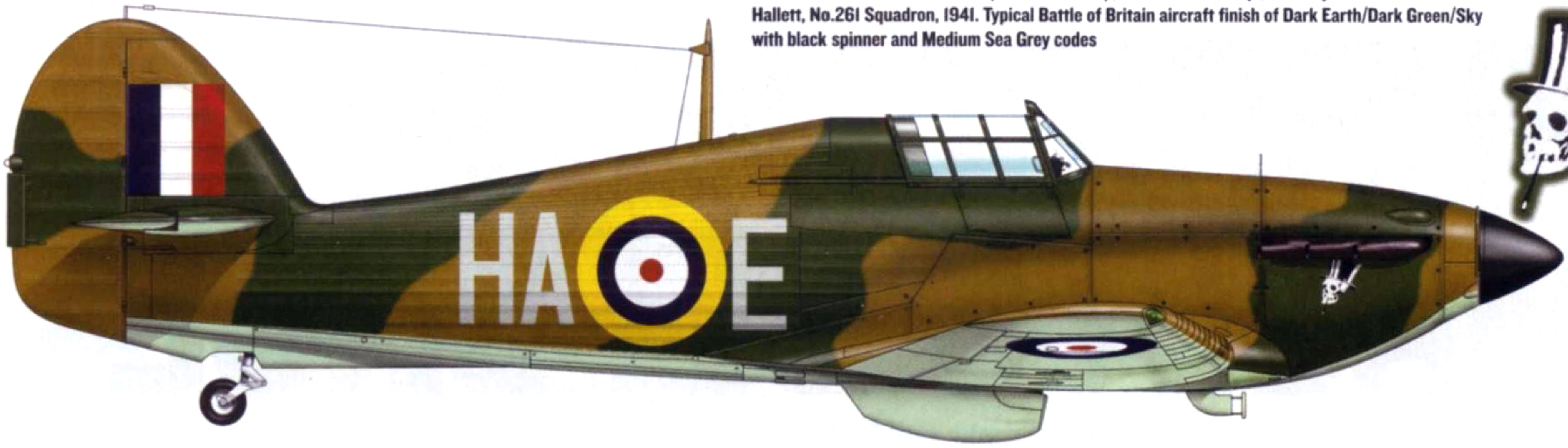
"On 18th July [1940] I was instructed to report at Abbotsinch, in Scotland, from Duxford where I was stationed flying Defiants with No.264 Squadron. On arrival I found that there were a number of RAF officers from other units in Fighter Command. The one common denominator was that we had all served in the Fleet Air Arm; we concluded that the mission was concerned with carrier operations.

"The next day 12 Hurricanes were delivered to us, they were painted in desert camouflage and had tropical filters and air cleaners. We surmised that our destination was East of Gibraltar. I had not flown the Hurricane before so I had a 20-minute familiarisation flight on 20th July. On 21st July the aircraft were carried by lighter to the docks and craned aboard the small aircraft carrier [HMS] Argus which was lying in dry dock. On the next day the Argus sailed down the Clyde to Greenock where we met up with our escorts, still not knowing where we were heading for. On board we were given the designation of No.418 Flight.

"We arrived at Gibraltar at the end of July where we learned that our destination was Malta. We were also told that after delivering the Hurricanes we would be returned to UK by Sunderland. On 2nd August we were to fly off Argus at extreme range from Malta at dawn with a Fleet Air Arm Skua, flown by Sgt H. Ayre and Capt K.L. Ford, as navigational escort. [A second escort Skua was flown by Fg Off. F.O. Bradbury with Sub Lt W.R. Nowell.]

"On the night of 30th July Argus left Gib, later to be joined by Admiral Somerville's Force H, in all a fantas-

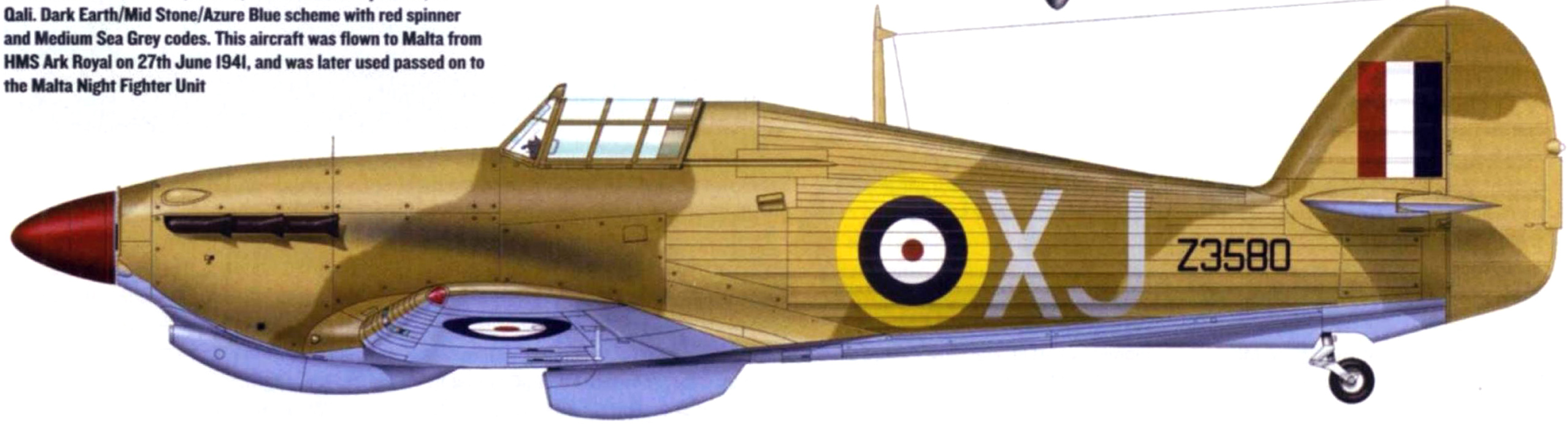
Hawker Hurricane Mk IIb, HA•E (serial unknown), 'Death Warmed Up', flown by Plt Off. Bill Hollis Hallett, No.261 Squadron, 1941. Typical Battle of Britain aircraft finish of Dark Earth/Dark Green/Sky with black spinner and Medium Sea Grey codes



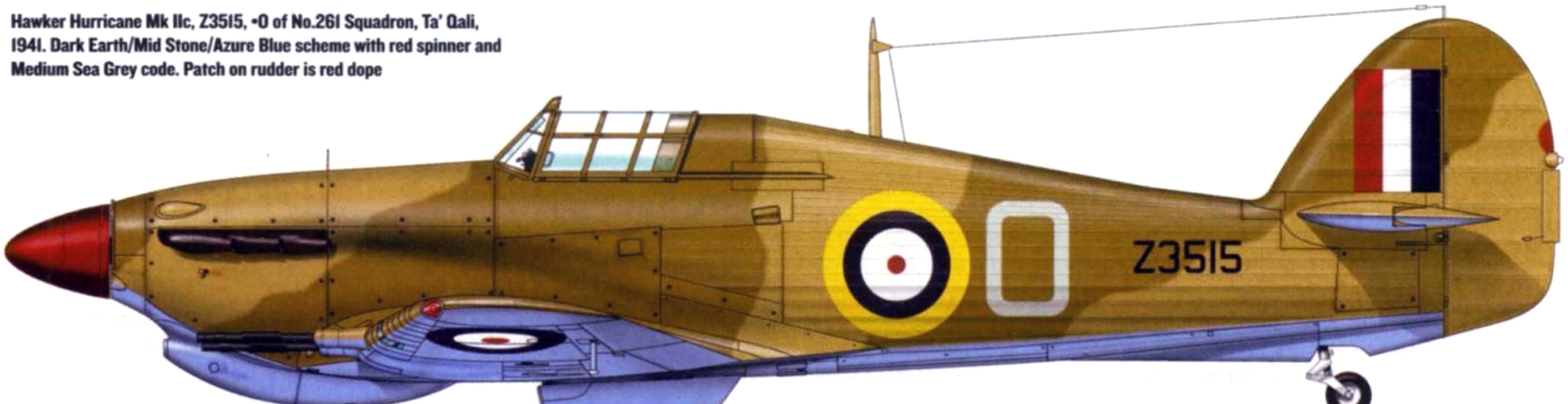
Upper surfaces of Hurricane Mk I in 'A' scheme pattern of Dark Earth/Dark Green applied to odd-serialled aircraft

Upper surfaces of Hurricane Mk I in 'B' scheme pattern of Dark Earth/Dark Green usually applied to even-serialled aircraft. Note that there are known examples with inverted colours in both schemes

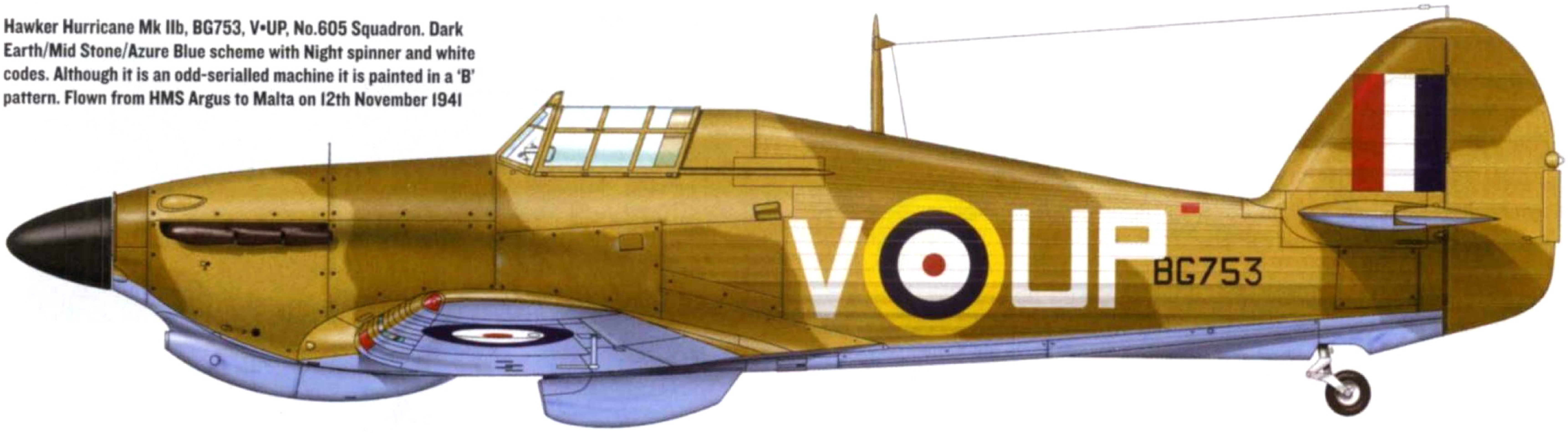
Hawker Hurricane Mk IIc, Z3580, •XJ of No.249 Squadron, Ta' Qali. Dark Earth/Mid Stone/Azure Blue scheme with red spinner and Medium Sea Grey codes. This aircraft was flown to Malta from HMS Ark Royal on 27th June 1941, and was later used passed on to the Malta Night Fighter Unit



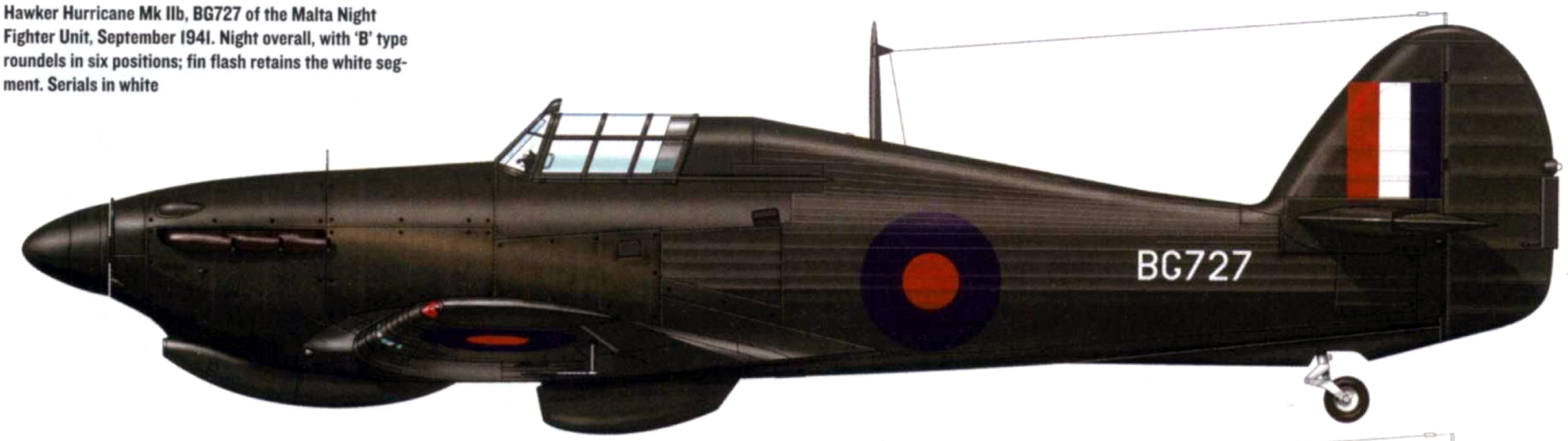
Hawker Hurricane Mk IIc, Z3515, •O of No.261 Squadron, Ta' Qali, 1941. Dark Earth/Mid Stone/Azure Blue scheme with red spinner and Medium Sea Grey code. Patch on rudder is red dope



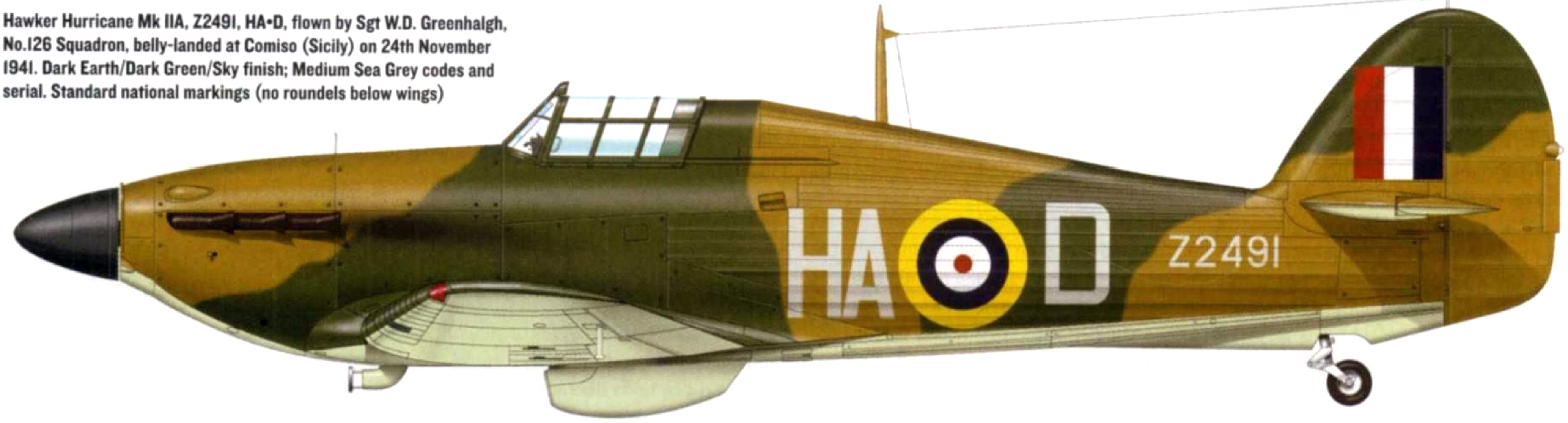
Hawker Hurricane Mk IIb, BG753, V•UP, No.605 Squadron. Dark Earth/Mid Stone/Azure Blue scheme with Night spinner and white codes. Although it is an odd-serialled machine it is painted in a 'B' pattern. Flown from HMS Argus to Malta on 12th November 1941



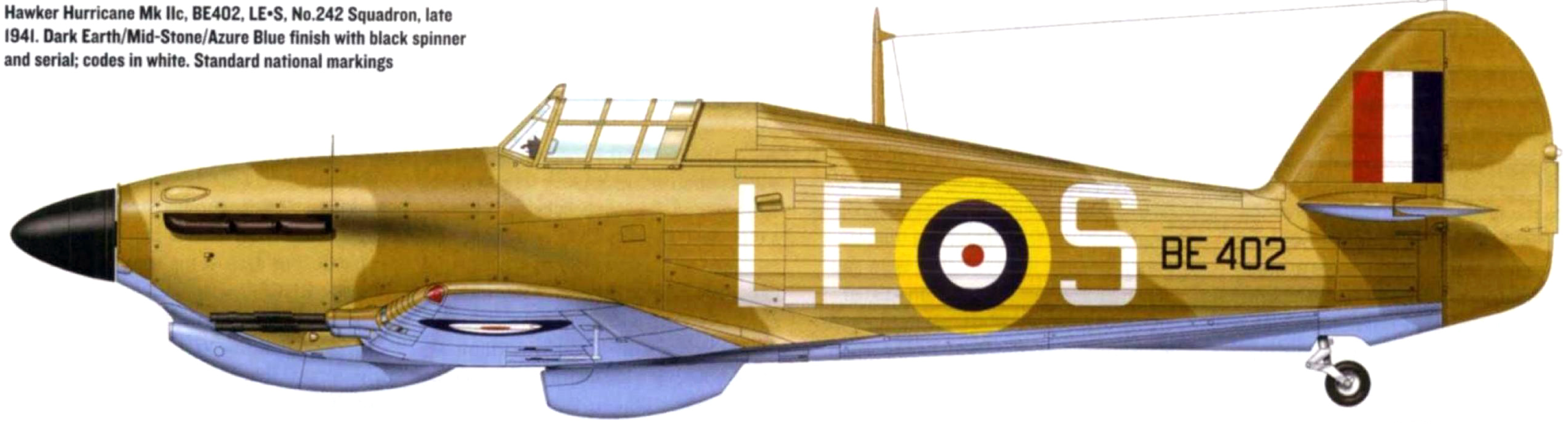
Hawker Hurricane Mk IIb, BG727 of the Malta Night Fighter Unit, September 1941. Night overall, with 'B' type roundels in six positions; fin flash retains the white segment. Serials in white



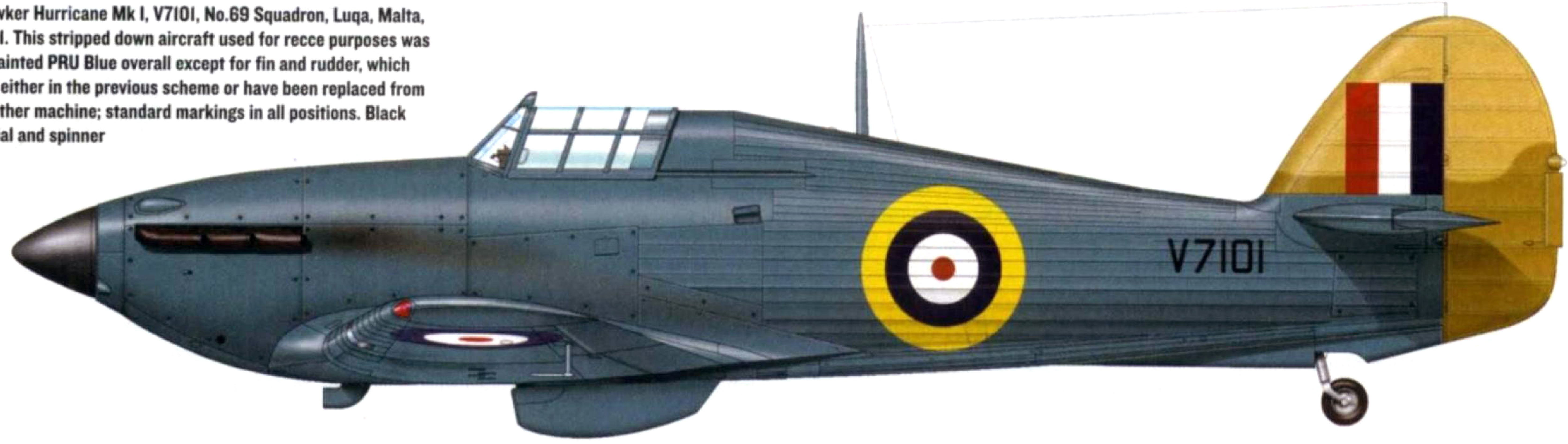
Hawker Hurricane Mk IIA, Z2491, HA•D, flown by Sgt W.D. Greenhalgh, No.126 Squadron, belly-landed at Comiso (Sicily) on 24th November 1941. Dark Earth/Dark Green/Sky finish; Medium Sea Grey codes and serial. Standard national markings (no roundels below wings)



Hawker Hurricane Mk IIc, BE402, LE•S, No.242 Squadron, late 1941. Dark Earth/Mid-Stone/Azure Blue finish with black spinner and serial; codes in white. Standard national markings



Hawker Hurricane Mk I, V7101, No.69 Squadron, Luqa, Malta, 1941. This stripped down aircraft used for recce purposes was repainted PRU Blue overall except for fin and rudder, which are either in the previous scheme or have been replaced from another machine; standard markings in all positions. Black serial and spinner



BG753 is a Mk IIb and its code clearly indicates that it belongs to No.605 Squadron. This aircraft had been flown off HMS Argus to Malta on 12th November 1941 (R.J. Caruana Archives)

Hurricane Mk IIc, BW826 (later coded 'A') in a typical Maltese protective pen built from stone slabs retreived from bombed buildings. As it has its ferry tanks still attached it could be assumed that this had just arrived to join No.185 Squadron. (R.J. Caruana Archives)

tic concentration of sea power and a certain amount of airpower since we included HMS Ark Royal. We flew off at a point 80 miles west of Gelite Island, about 430 miles from Malta. I flew Hurricane N2673 and the flight in formation took 2hrs 50mins landing at Luqa, all aircraft arriving safely but with very little fuel. The final aircraft flown by Sgt Robertson was damaged on landing.

"On arrival we were met by the Station Commander Luqa, Wg Cdr R.C. Jones, and the Air Officer Commanding, Malta, Air Commodore Maynard. After the welcome came the bombshell that we were to stay on as Malta was short of fighter pilots".

The Flight absorbed the remaining Gladiators and formed No.261 Squadron under the command of Sqn Ldr D.W. Balden on 16th August. 'A Flight' was under the command of A.J. Trumble while 'B Flight' fell under the command of Flt Lt J. Greenhalgh.

'Operation White', a second consignment of Hurricanes on 17th August, ended in tragedy as only four of the twelve aircraft arrived; the others had to ditch at sea as they ran out of fuel. An inquiry that followed laid the blame for the loss on the pilots while a more creditable version would have been that someone had badly misjudged the Hurricane's true ferry range.

INTO ACTION

The new arrivals were declared operational on 3rd August, but it was on the 13th that they saw any real action. Italian Ju 87s (Picchiatelli) performed their first attack on Malta on 4th September, although it was on the 17th that the Hurricanes scored against this type. Barber took off with two other Hurricanes and pressed home an attack against a Ju 87 from 236ª Squadriglia, which he later saw crashing into the sea near Filfla. Woods shot down an escorting CR.42, whose pilot managed to bale out safely.

By the end of that year the RAF's fighter strength at Malta consisted of about 16 Hurricanes of No.261 Squadron together with four surviving Sea Gladiators. The desultory attacks by the Regia Aeronautica against the airfields (Luqa, Ta' Qali, Hal Far) and the dock area proved unable to check the convoys that reinforced Malta between September and November. This situation changed dramatically with the Luftwaffe's arrival in Sicily towards the end of December, as Fliegerkorps X under the command of General der Flieger Hans Geisler arrived in Sicily for operations against Malta.

On 6th January 1941 'Operation Excess' left Gibraltar under Force H with three supply ships for Greece and one for Malta. The convoy and escort came under heavy attack the following day. HMS Illustrious became the prime target and was hit several times until she entered Grand Harbour at 18:00 of 10th January with 126 of her crew dead and 91 badly wounded. After a lull of six days, all hell broke loose on 16th January when the Luftwaffe returned to finish Illustrious in Malta's dockyard. The Hurricanes were sent to intercept the Ju 87s and Ju 88s, five of which fell to the combined action of the defending fighters and anti-aircraft gunners. During the following days attacks increased in ferocity, reaching their height three days later, although bombing continued until the carrier left Malta on the night of the 23rd.

Hurricanes of No.261 Squadron were at times assisted by seven Fulmars from Illustrious (No.860 Sqdn) which had been flown to Malta when the carrier was still at sea. Notwithstanding the heavy Luftwaffe losses, the Hurricanes and Gladiators remained unscathed. However, they were to become easy prey to the Messerschmitts Bf 109 of 7./JG 26 commanded by Oblt Joachim Muncheberg that arrived in Sicily later that month.

REINFORCEMENTS

A serious attempt to reinforce Malta's dwindling Hurricane force came on 3rd April when HMSs Ark Royal and Furious launched 24 of the improved Mk II. These were followed by 160 additional Hurricanes by the end of June, a number of which were passed on to North Africa. On 9th May, MV Breconshire arrived at Malta with 50 airmen to service the new arrivals. Maynard handed over to Air Vice Marshal H.P. Lloyd and on 12th May No.261 Sqn and No.1435 Flight were amalgamated to form No.185 Squadron under the command of Sqn Ldr P.W. Mould, DFC. No.249 (commanded by Sqn Ldr Barton, DFC) was based at Ta' Qali and was soon joined by No.261, thus leaving Luqa and Ta' Qali free for transiting aircraft flying to North Africa and the Middle East. On 25th May No.249 suffered heavily at the hands of pilots from 7./JG 26 as ten Hurricanes were hit during a strafing raid as their pilots were strapped to their seats at readiness.

A third Hurricane unit was formed on 28th June from personnel of No.46 Squadron. Designated No.126, this unit fell under the command of Sqn Ldr A.C. Rabagliati, DFC, and joined the other Hurricane units at Ta' Qali. But it was to take the unit until August to be fully operational when 180 NCOs arrived from UK to bring it up to full strength. It went into action for the first time on 26th August engaging Macchi C.200s, of which three were claimed as destroyed. By October it was taking the war to the enemy's camp by performing fighter-bomber sorties against Comiso and Ragusa.

No.185 operated its first sortie on 23rd June and moved to Hal Far in July. On the 6th and 9th of that month, the squadron went on to the offensive carrying out sweeps over the Sicilian coast, strafing the seaplanes at their bases in Augusta and Syracuse. Six enemy aircraft were claimed as destroyed by these Hurricanes, a further four being damaged. No.185 was the receiving end of the stick two days later when Hal Far was attacked en-mass by some 40 C.200s, three of which were shot down. Successes continued, for by the end of the month, 185 claimed more SM.79s and BR.20s destroyed or damaged. However their crowning glory was their part in the clean-up operation after an Italian E-boat flotilla attack against Grand Harbour on 26th July, during which the attacking force was completely routed by Maltese coastal gunners. The Hurricanes claimed four E-boats and a Macchi C.200 escort destroyed.

At the end of August the Malta Night Fighter Unit was formed with 12 Hurricanes at Ta' Qali under the command of Sqn Ldr F.F. Powell-Sheddon, DFC, to combat the nuisance raids that were being sent over the island by small groups of aircraft throughout the night. Flying only at night and guided by the ground searchlights, these Hurricanes achieved very good results, so much so that these raids decreased. The unit was officially sanctioned on 4 December as No.1435 Flight and came under the command of Sqn Ldr I.B. Westmacott, at a time when Hurricanes Mk II had become available.

During the winter of 1941, No.185 Squadron operated an all-black Hurricane flown by Wg Cdr Dawson, aptly named 'Dawson's Folly'. It carried a standard 33-gallon fuel tank under one wing and a container of equal size under the other. This was brought under strict guard from RAF HQ in Valletta and the Hurricane would usually perform a three-hour night sortie, returning minus the container. Whenever it returned with it, the container was immediately taken back to RAF HQ. The operation ended when Dawson returned with the container four nights running. Most probably Dawson was running arms to partisans either in Sicily or Southern Italy, or maybe even in Yugoslavia, and the operations ended when all contact had been lost.

OUTCLASSED

Towards the second half of 1941 the Hurricane was outclassed, outrun and outgunned by most of the aircraft that the Axis were now throwing into the battle. By September it was facing the new Macchi C.202s of the 4° Stormo and, later in December, those of 16° Gruppo. However, the death-knell of the Hurricane came with the arrival of II./JG 53 and II./JG 3 and their deadly Messerschmitt Bf 109F/Trop. Notwithstanding further reinforcements in September and November these could hardly keep up with the rate of attrition, as the Hurricanes continued to be sent up against wave after wave of bombers and escorting fighters.

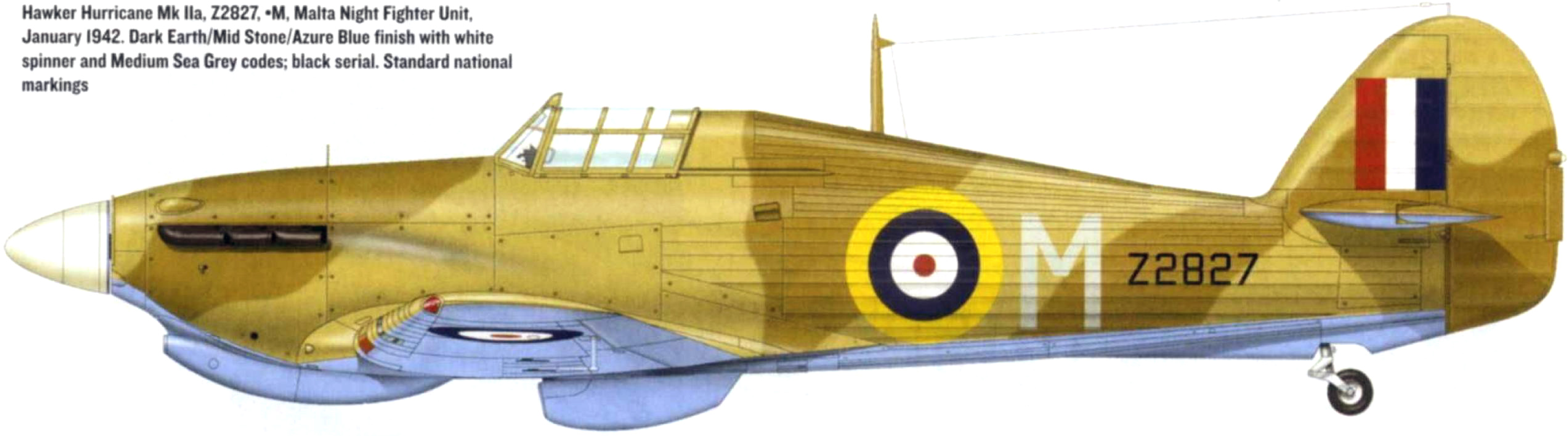
During the middle of September 1941 Hurricanes of No.185 Squadron were fitted with underwing racks to take four 40lb (18kg) bombs, using them for the first time on the 28th of that month. The three bombing raids on Sicily that day were a diversion to enable a large convoy to enter Grand Harbour. Ships in this convoy carried servicemen including ground crew for No.828 Squadron, FAA.

In mid-January 1942, II Fliegerkorps resumed its attack against Malta, in view of an invasion plan (Operation Herkules) projected for May. Though the invasion was postponed and then cancelled (probably due to the appalling losses suffered in a similar operation against Crete) the defending Hurricanes found that they could do little against the superiority of the new Bf 109F.

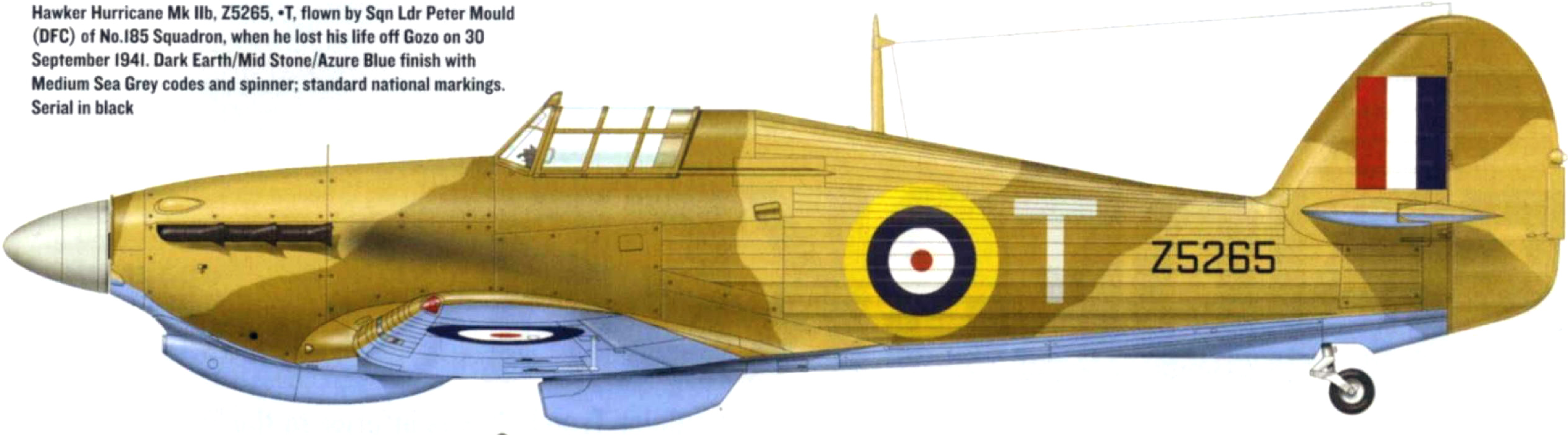
Bad weather that winter proved a providential buffer to the attacks but it was clear that Malta could survive only if supplied with Spitfires, the type of aircraft that the defenders had been requesting for nearly a year.

These arrived in March 1942 going mainly to Nos.126 and 249 Squadrons at Ta' Qali. It was not the end of the Hurricane saga, however, as the older aircrat remained on the front line for many more months. Throughout spring and summer of 1942, No.185 Squadron was very busy intercepting Italian and German formations with Hurricanes and Spitfires. It was only in May that the unit's Hurricanes could be laid aside when re-equipment was completed. ■

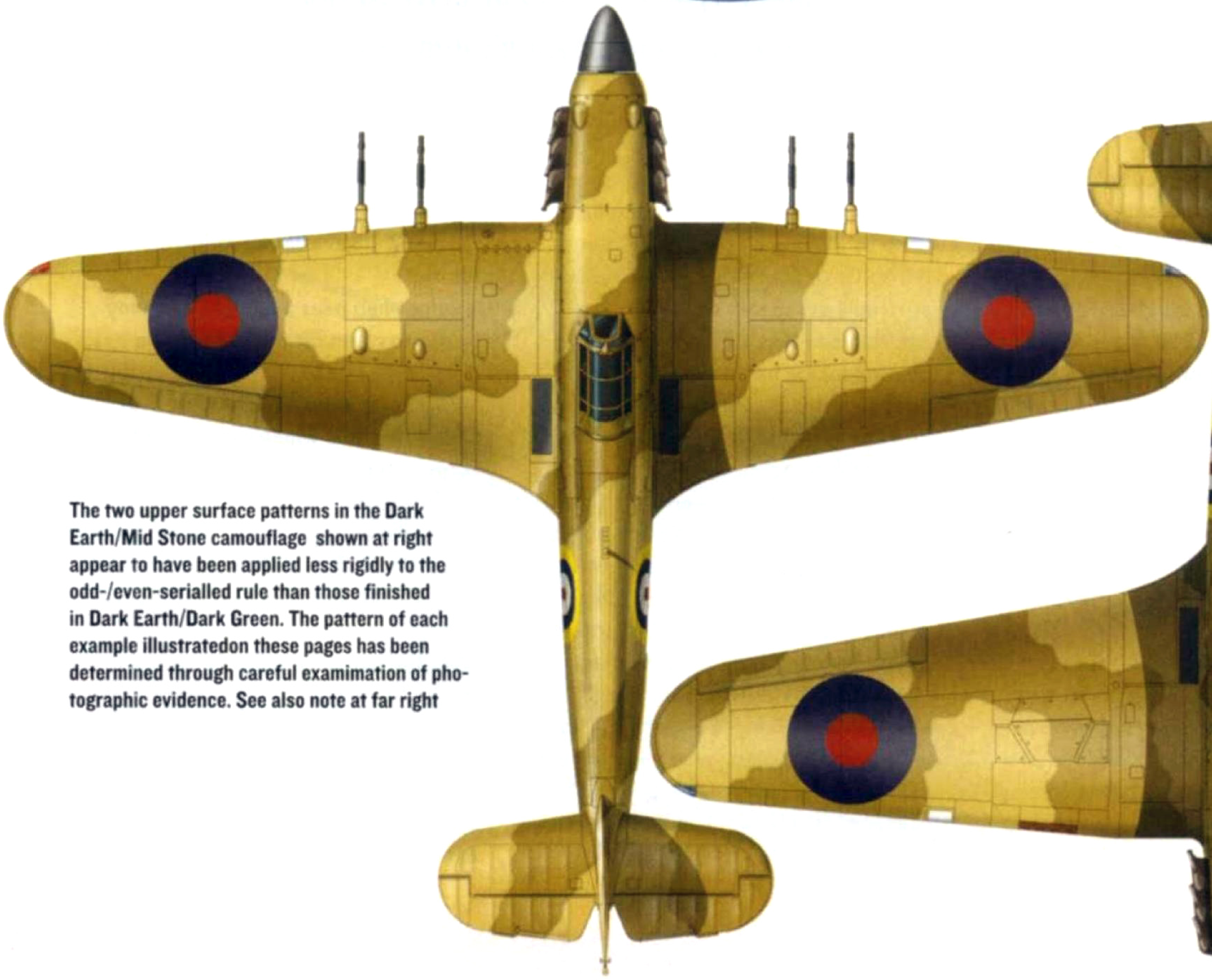
Hawker Hurricane Mk IIa, Z2827, •M, Malta Night Fighter Unit, January 1942. Dark Earth/Mid Stone/Azure Blue finish with white spinner and Medium Sea Grey codes; black serial. Standard national markings



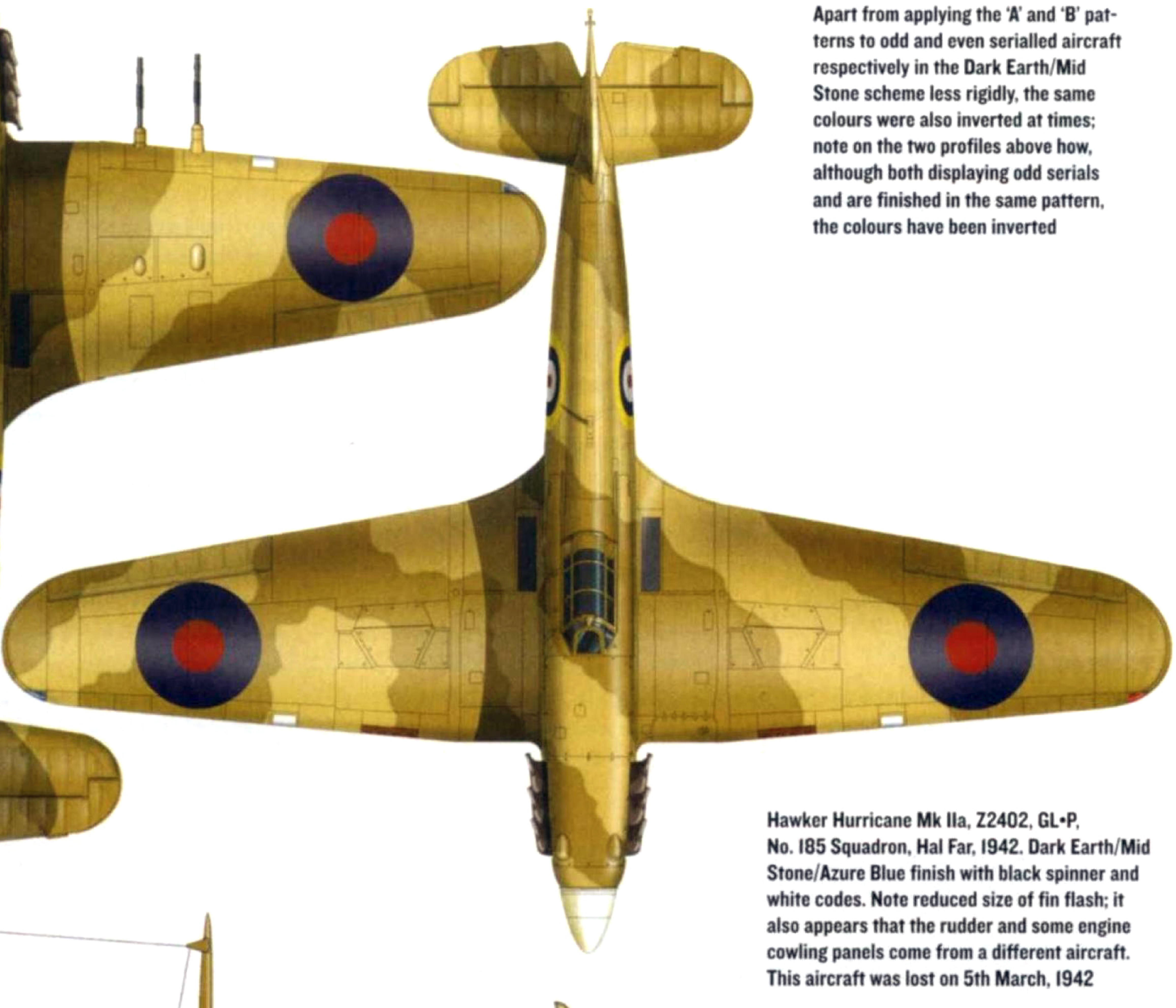
Hawker Hurricane Mk IIb, Z5265, •T, flown by Sqn Ldr Peter Mould (DFC) of No.185 Squadron, when he lost his life off Gozo on 30 September 1941. Dark Earth/Mid Stone/Azure Blue finish with Medium Sea Grey codes and spinner; standard national markings. Serial in black



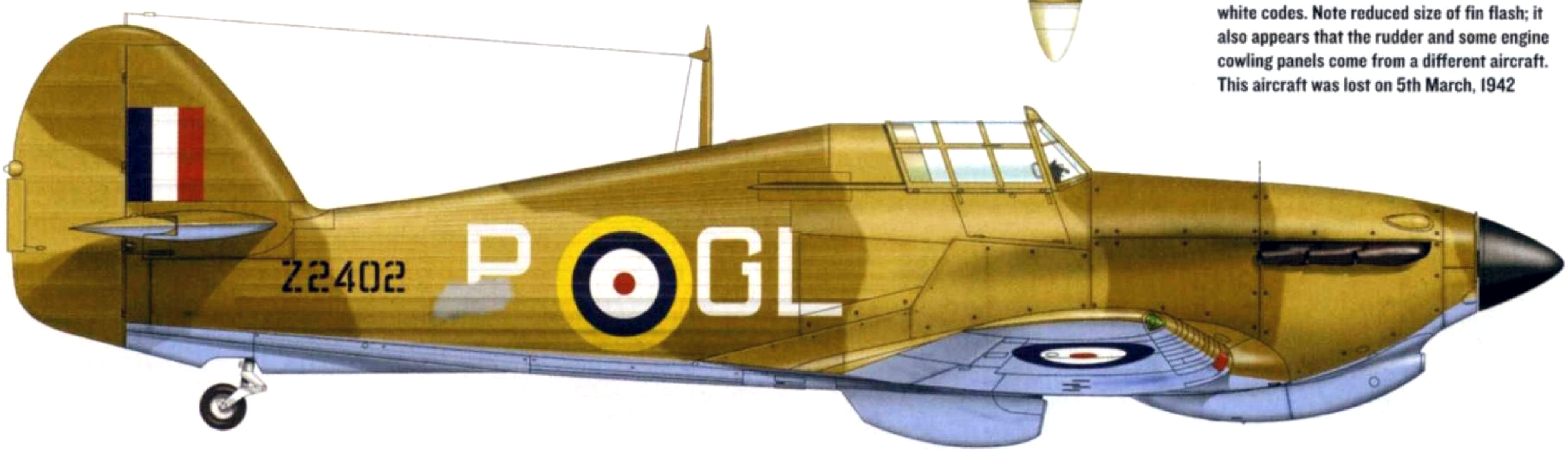
Apart from applying the 'A' and 'B' patterns to odd and even serialled aircraft respectively in the Dark Earth/Mid Stone scheme less rigidly, the same colours were also inverted at times; note on the two profiles above how, although both displaying odd serials and are finished in the same pattern, the colours have been inverted



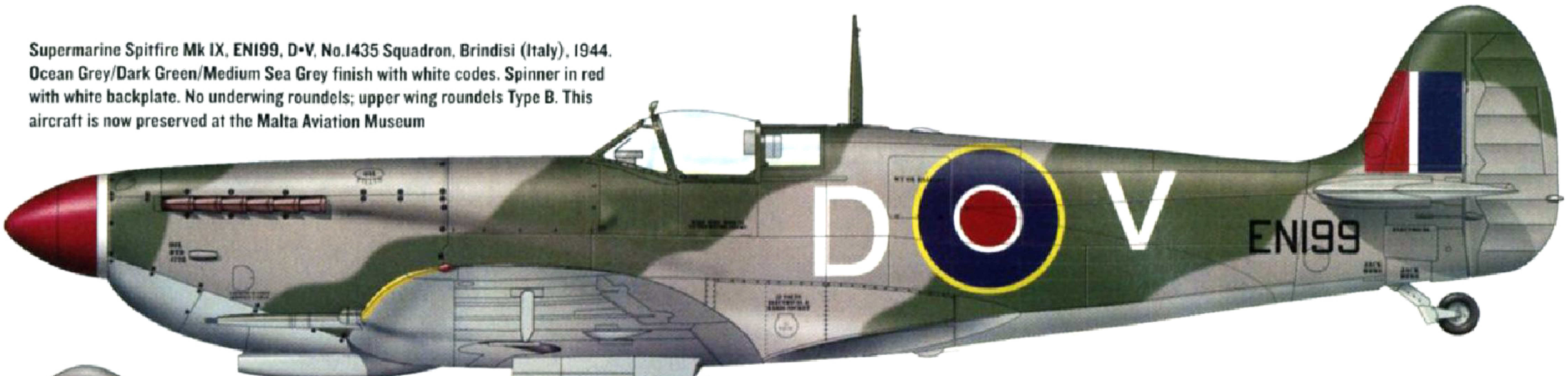
The two upper surface patterns in the Dark Earth/Mid Stone camouflage shown at right appear to have been applied less rigidly to the odd-/even-serialled rule than those finished in Dark Earth/Dark Green. The pattern of each example illustratedon these pages has been determined through careful examimation of photographic evidence. See also note at far right



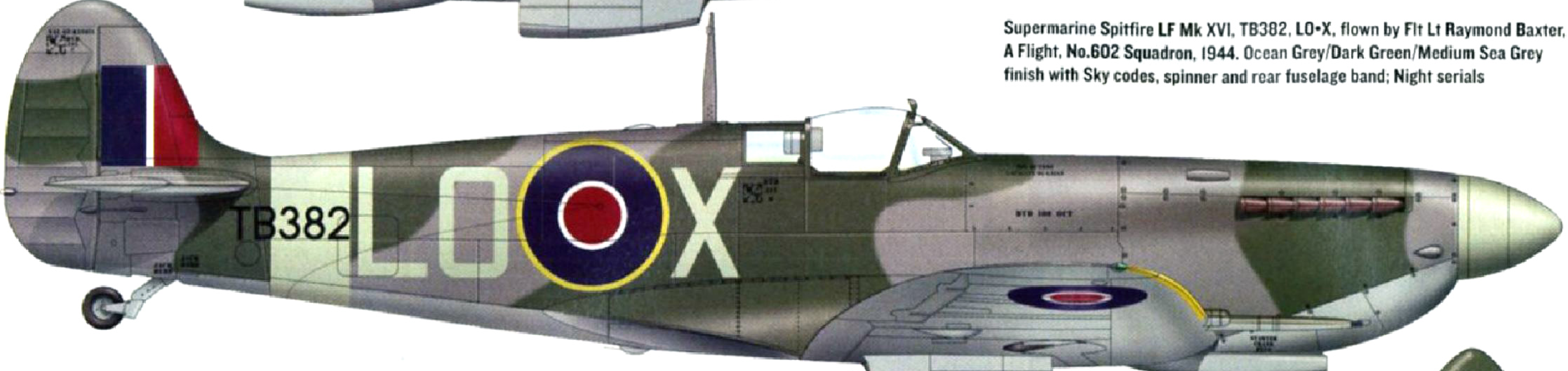
Hawker Hurricane Mk IIa, Z2402, GL•P, No. 185 Squadron, Hal Far, 1942. Dark Earth/Mid Stone/Azure Blue finish with black spinner and white codes. Note reduced size of fin flash; it also appears that the rudder and some engine cowling panels come from a different aircraft. This aircraft was lost on 5th March, 1942



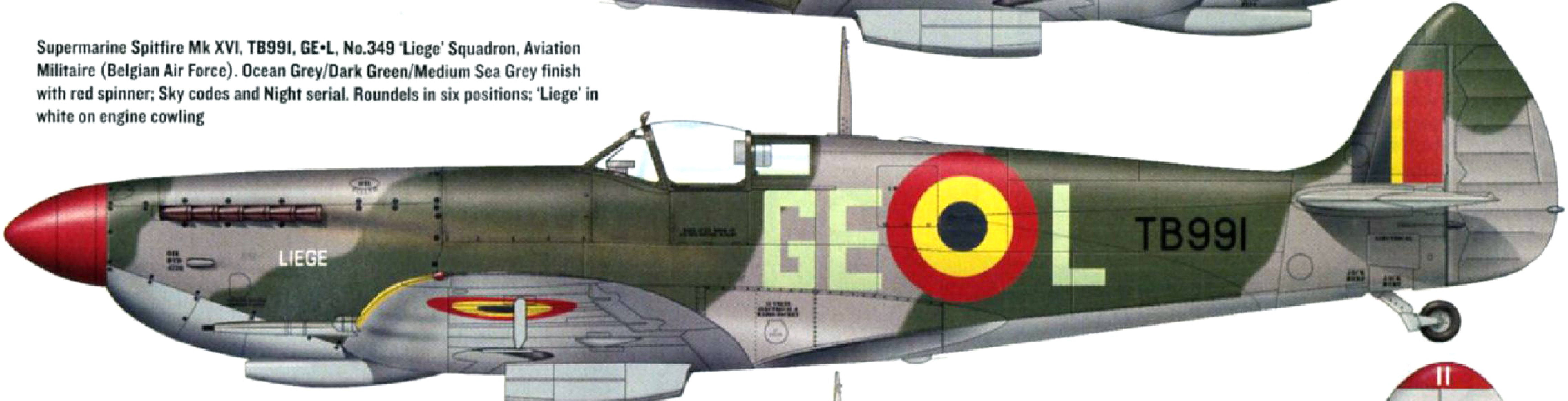
Supermarine Spitfire Mk IX, EN199, D•V, No.1435 Squadron, Brindisi (Italy), 1944. Ocean Grey/Dark Green/Medium Sea Grey finish with white codes. Spinner in red with white backplate. No underwing roundels; upper wing roundels Type B. This aircraft is now preserved at the Malta Aviation Museum



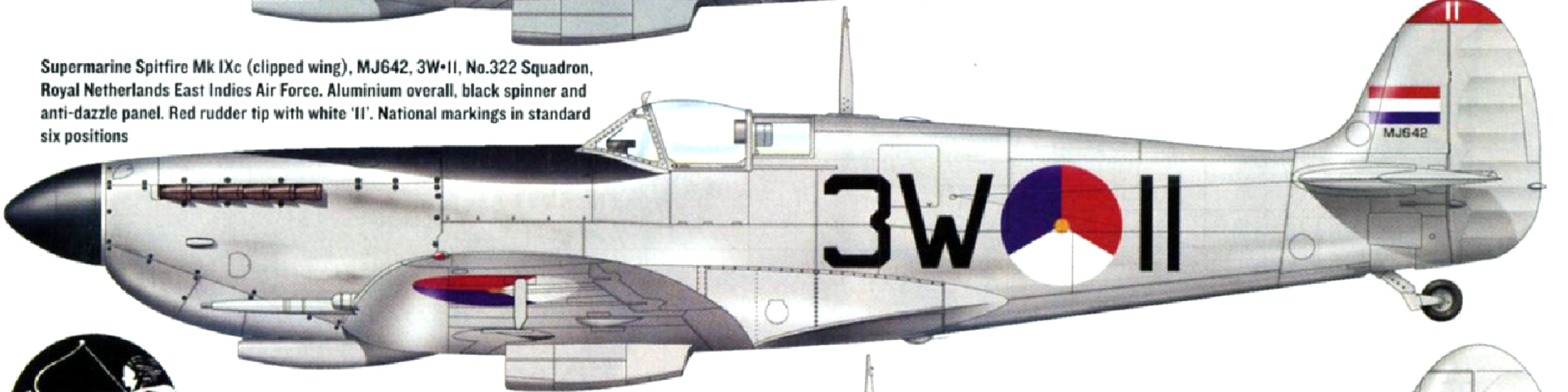
Supermarine Spitfire LF Mk XVI, TB382, LO•X, flown by Flt Lt Raymond Baxter, A Flight, No.602 Squadron, 1944. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes, spinner and rear fuselage band; Night serials



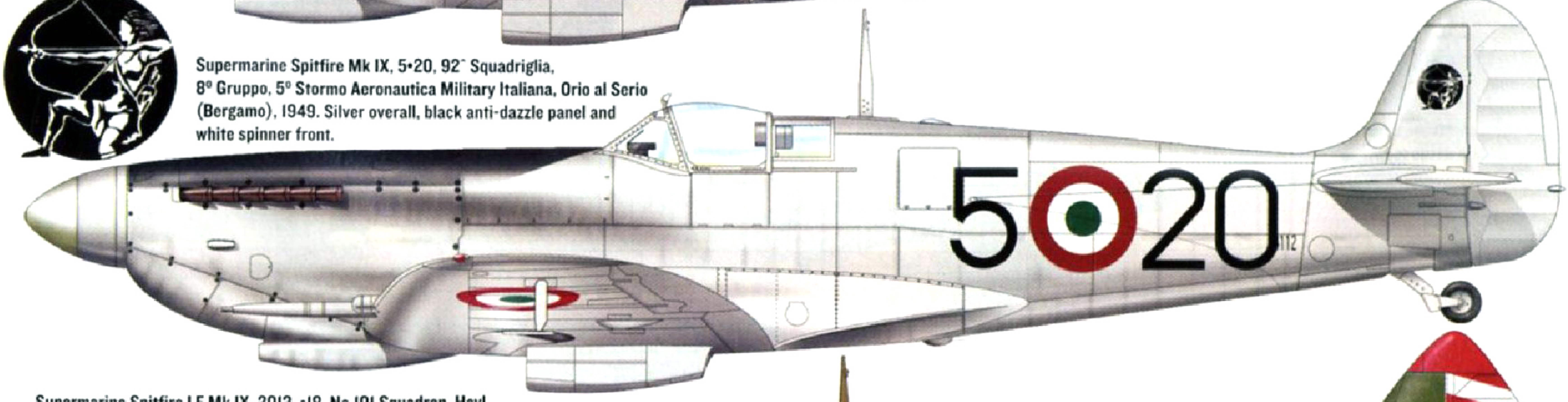
Supermarine Spitfire Mk XVI, TB991, GE•L, No.349 'Liege' Squadron, Aviation Militaire (Belgian Air Force). Ocean Grey/Dark Green/Medium Sea Grey finish with red spinner; Sky codes and Night serial. Roundels in six positions; 'Liege' in white on engine cowling



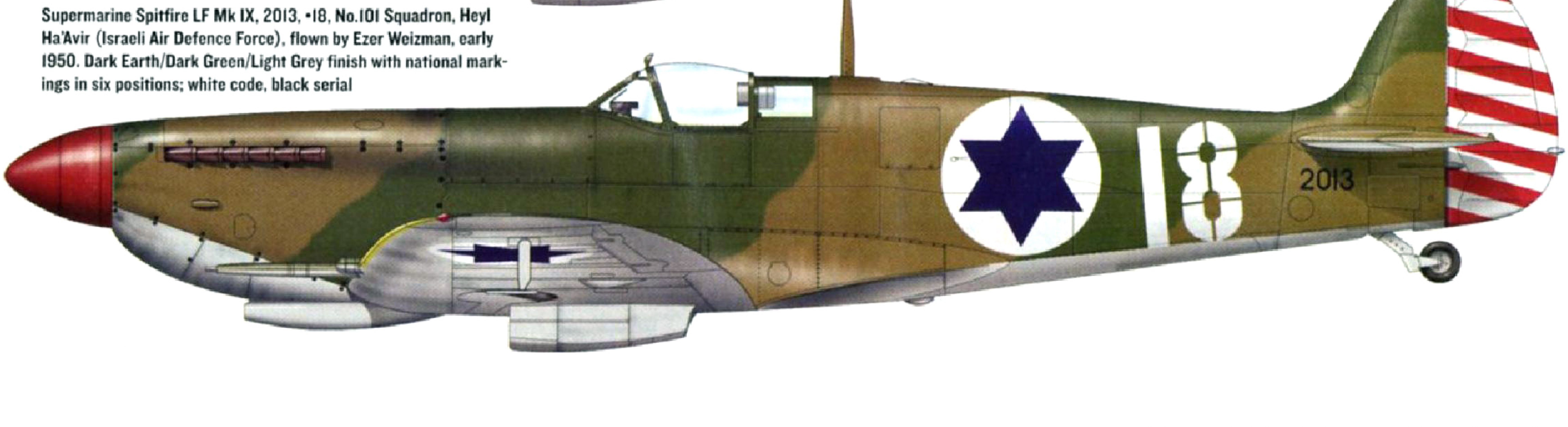
Supermarine Spitfire Mk IXc (clipped wing), MJ642, 3W•11, No.322 Squadron, Royal Netherlands East Indies Air Force. Aluminium overall, black spinner and anti-dazzle panel. Red rudder tip with white '11'. National markings in standard six positions



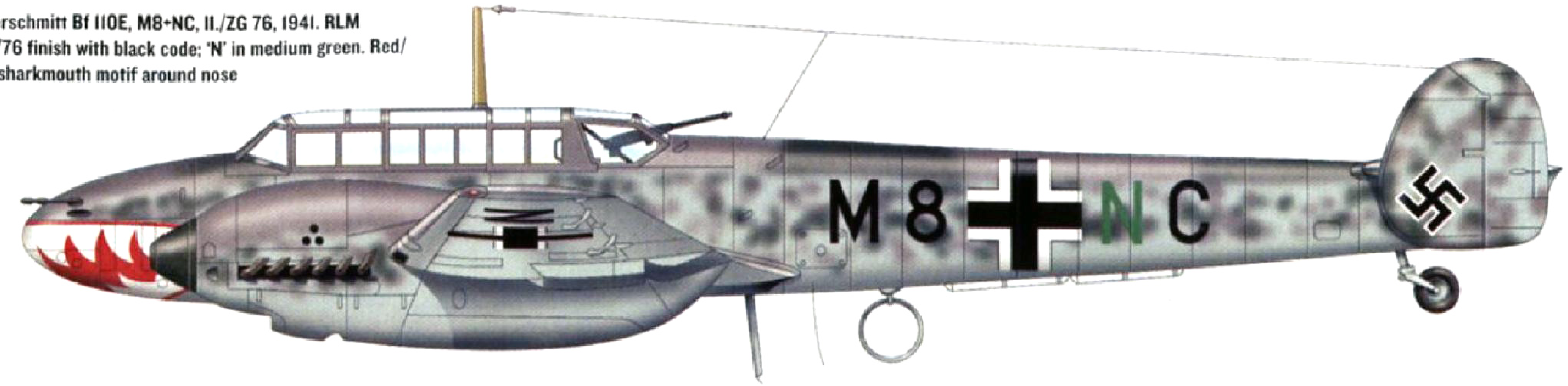
Supermarine Spitfire Mk IX, 5•20, 92° Squadriglia, 8° Gruppo, 5° Stormo Aeronautica Military Italiana, Orio al Serio (Bergamo), 1949. Silver overall, black anti-dazzle panel and white spinner front.



Supermarine Spitfire LF Mk IX, 2013, •18, No.101 Squadron, Heyl Ha'Avir (Israeli Air Defence Force), flown by Ezer Weizman, early 1950. Dark Earth/Dark Green/Light Grey finish with national markings in six positions; white code, black serial



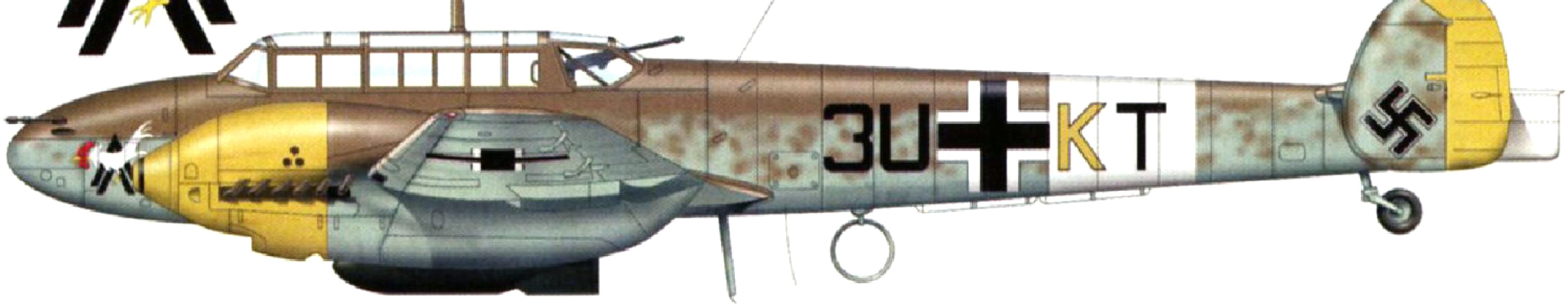
Messerschmitt Bf 110E, M8+NC, II./ZG 76, 1941. RLM 74/75/76 finish with black code; 'N' in medium green. Red/white sharkmouth motif around nose



Messerschmitt Bf 110E-2, 6K+YN, 5(H)/Aufkl. Gr.23, Russia, October 1941. RLM 74/75/76 finish with Gelb 04 bands around rear fuselage and beneath undersides of wingtips; all-black code on fuselage sides

Messerschmitt Bf 110D-1, W/Nr. 2354, 3U+DT, 9./ZG 26, Daba, North Africa. RLM 79 upper surfaces with RLM 80 mottling; undersides in RLM 65. White fuselage band and undersides of wingtips; code in black with yellow 'D'. Spinner front in yellow, unit badge on nose

Messerschmitt Bf 110E-2, 3U+KT of 9./ZG 26, North Africa, March 1942. RLM 78/79 scheme with Gelb 27 engine cowlings and rudder. Broad white fuselage band and extreme end of tail. 'K' of code is also in Gelb, outlined in black. Note thin black line on spinner

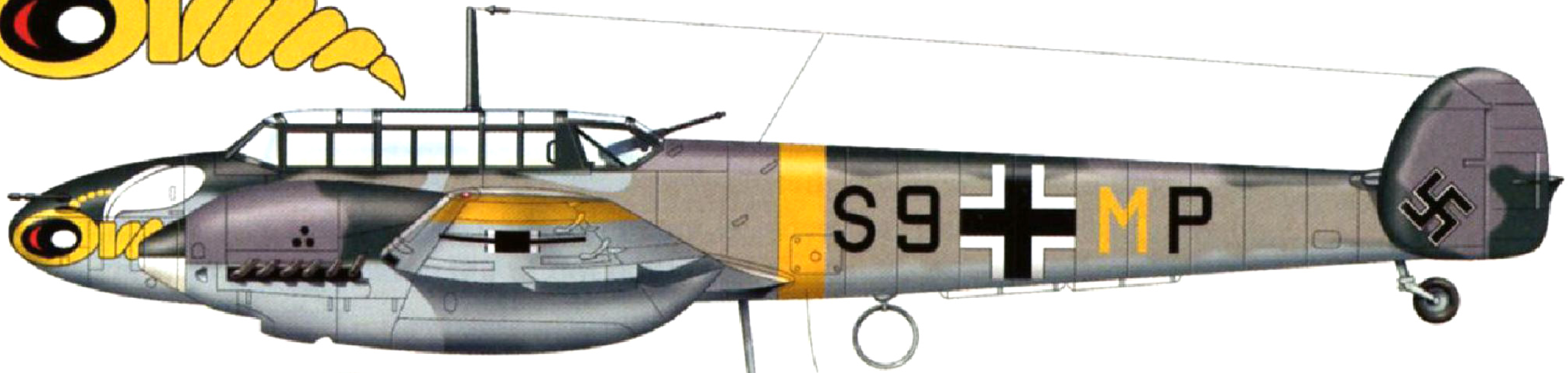


Messerschmitt Bf 110E, D5+DT, 9./NJG 3, France, 1942. Black overall with light grey codes; red/white sharkmouth motif around nose. Rot RLM 23 spinner fronts

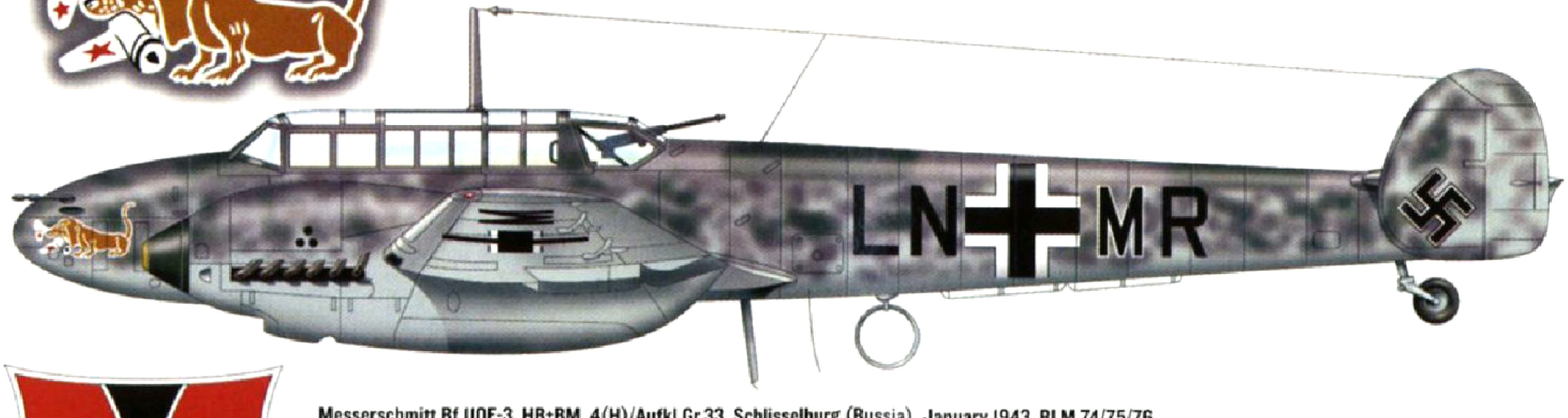
Messerschmitt Bf 110E-1, Wk/Nr. 4018, 2S+NM, 5./ZG 2, Russian Front, July 1942. RLM 71/02/65 finish with Gelb RLM 02 bands around rear fuselage and undersides of wingtips; code in black, with 'N' in Rot RLM 23 as are the spinner fronts

Messerschmitt Bf 110E-1, G9+BC, NJG 1. Black overall with light grey codes and blue 'B', outlined in white; light grey chevron, outlined white, aft of cockpit. Unit badge on fuselage sides

Messerschmitt Bf 110E-1, S9+MP, 6./ZG1, Russia, Autumn 1942. RLM 74/75 uppersurfaces with RLM 65 undersides; side of fuselage filled up in RLM 02. Gelb 04 fuselage band and underside of wingtips; 'Wespe' motif on nose. Spinner RLM70/White



Messerschmitt Bf 110E-2, LN+MR, 13./ZG 5, 1942. RLM 74/75/76 finish with codes in black, 'M' outlined in white; front of spinner in Gelb 04. Unit badge on nose

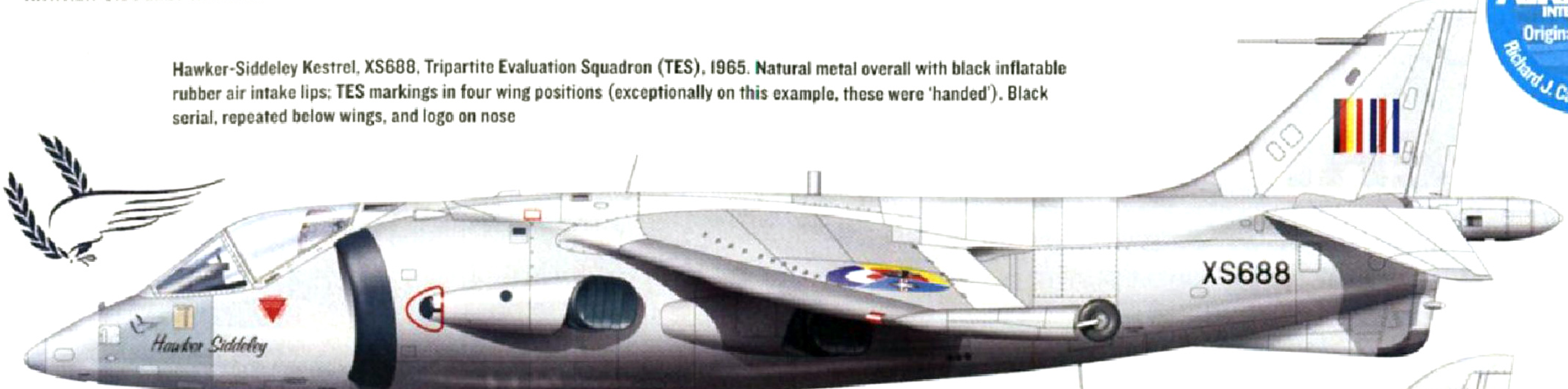


Messerschmitt Bf 110E-3, HB+BM, 4(H)/Aufkl.Gr.33, Schlisselburg (Russia), January 1943. RLM 74/75/76 scheme with Gelb 04 band around rear fuselage and below wingtips; code in black with 'B' in white. Unit badge on nose

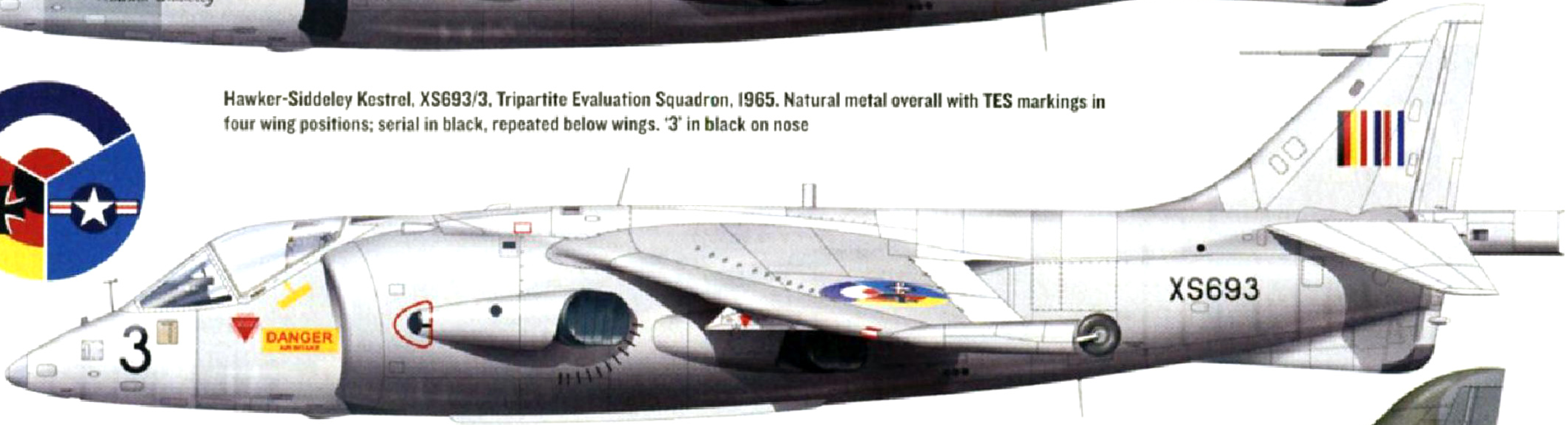
HISTORICAL FEATURE

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2007

Hawker-Siddeley Kestrel, XS688, Tripartite Evaluation Squadron (TES), 1965. Natural metal overall with black inflatable rubber air intake lips; TES markings in four wing positions (exceptionally on this example, these were 'handed'). Black serial, repeated below wings, and logo on nose



Hawker-Siddeley Kestrel, XS693/3, Tripartite Evaluation Squadron, 1965. Natural metal overall with TES markings in four wing positions; serial in black, repeated below wings. '3' in black on nose



Hawker-Siddeley Harrier GR Mk I, XV277, Dunsfold, 1969. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with national markings in bright colours; 36in. diameter roundels above and below wings, 24in. diameter roundels on air intakes. Black serial, repeated below wings

Hawker-Siddeley Harrier GR Mk I, XV279, Dunsfold, 1969. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with national markings in bright colours; 36in. diameter roundels above and below wings, 24in. diameter roundels on air intakes. Black serial, repeated below wings. Unpainted nose cone and parachute tail housing

Hawker-Siddeley Harrier GR Mk I, XV755, Harrier Conversion Team, displayed at Biggin Hill, 19th September 1969. Gloss Dark Sea Grey/Dark Green/Light Aircraft Grey finish with national markings in red/white/blue; roundels in six positions. Serial in black, repeated below wings; RAF Wittering crest on fin

Hawker-Siddeley Harrier GR Mk I, XV783, No.I Squadron, Wittering, 1969. Gloss Dark Sea Grey/Dark Green/Light Aircraft Grey finish with national markings in red/white/blue; roundels in six positions. Serial in black, repeated below wings; unit badge, flanked by red/white arrowheads, on nose. RAF Wittering crest on fin

Harrier GR Mk I, XV760 of the Harrier Operational Conversion Unit finished in the original high gloss three-tone scheme of Dark Sea Grey/Dark Green/Light Aircraft Grey with high visibility and bright coloured national markings; note the fin code in different styles of numbers (*Richard J. Caruana Archives*)

WRITTEN BY RICHARD J. CARUANA

BIRTH OF THE JUMP JET

Early versions of the Hawker-Siddeley Harrier

Fifty years after its conception, the Harrier remains unique in its genre. Yet few realise that this was one of the last private ventures to eventually emerge from Britain's aviation industry, and also the last in which Sir Sidney Camm played a decisive role. Although credit is usually ascribed to the design team he had built up over the previous four decades, Camm decided to initiate such an ambitious project after a meeting he had with Dr Stanley Hooker of the Bristol Engine Company early in 1957.

The previous year, Hooker learned of a Frenchman's project for a vertical take-off and landing (VTOL) aeroplane known as the *Gyroptère*. The design conceived by Michel Wibault featured swivelling compressors on either side of the fuselage fed by air from a conventional gas turbine engine. This led Bristol's design team to embark on a project to study and refine the idea that eventually led to the BE.52, combining the Orpheus and Olympus to provide a ducted fan jet with rotating 'cold' nozzles on either side of the compressor while hot air exited through a conventional central tailpipe.

Ralph S. Hooper, senior project engineer at Hawker's, was entrusted with the task of drawing up a layout to embody such an engine, under the designation of P.1127. Very soon, the tail pipe arrangement was changed to one similar to that of the Sea Hawk whereby hot air exited through bifurcated nozzles, except that in this case these were also rotatable. Bristol's engine project became BE.53 so as to incorporate such changes. By August 1957, the Hawker P.1127 became more than a paper project; its design continued to evolve through a programme of very close cooperation between aircraft and engine design engineers.

Unfortunately, this was a time when the infamous Defence White Paper of spring 1957 was wrecking havoc within the British aviation industry, including the scrapping of such advanced projects as the TSR.2. In such light, Hawker found absolutely no official financial backing and had to look towards NATO as a possible source of funds and, eventually, sales of its VTOL design. If such interest materialised, Hawker could at least aspire for funding through the Mutual Weapons Development Programme (MWDP). Although funding to the tune of 75 percent of development costs for six Bristol BE.53 engines was allocated through MWDP, Hawker had to continue its design project using company funds after a decision to build two P.1127 prototypes had been, very courageously, taken in April 1959.

The only assistance received at that time by the P.1127 project was the use of Langley's National Aeronautics and Space Administration (NASA) wind tunnel facilities to test its models. However Hawker's determination and foresight began to be rewarded as interest in its project increased from day to day, especially after all design work had been passed on to the Experimental Design Office at Kingston. Draft requirement GOR.345 for a Hunter replacement was issued in October 1959 was the first ray of hope that official recognition had finally been achieved, accompanied by a grant of £75,000 supposedly to cover design work that had already been done on the P.1127!

Work at Bristol had moved in great strides, and by March 1960 they had bench-tested an engine earmarked for the P.1127 prototype, which provided 10,000lb installed thrust. At around the same time, Hawker was invited to tender for four development aircraft and in June it also received funding for the two private-venture machines that were nearing completion.

While the two senior test pilots, Bill Bedford and Hugh Merewether, familiarised themselves with the Bell X-14 at Ames Air Force Base (AFB) in the United States, the first engine was delivered to Hawker on 6th May 1960. This was installed in XP831, and on 22nd June an official contract for the two prototypes (XP831 & XP836) was signed. The first prototype was delivered to Dunsfold on 15th July and ground running of the engine began on 31st August using a specially designed 'silencing pen'. The first Pegasus flight engine arrived on 13th October and when installed, XP831 flew in hover for the first time on 21st October 1960, piloted by Bill Bedford despite having his right leg in a plaster cast, having been declared "fit to fly, tethered mode only" by the RAF's Central Medical Board! With no markings at all over its bare metal finish, it was tethered at the nose wheel and at each wingtip and apart from its unconventional shape the aircraft also left its mark on those witnessing the flight for its indescribably deafening noise!

No.4 Squadron Harrier GR Mk I, XV784/D, photographed on 6th December 1975. It is finished in the intermediate scheme, that is in matt colours but still retaining its Light Aircraft Grey undersides; note how the pattern of the Dark Green on the fin does not continue onto the rudder, ensuring that each detachable part of one aircraft could be fitted onto another without mis-match (*Dennis Robinson*)

INTRODUCING THE KESTREL

An order for a further four prototypes (XP972, XP976, XP980 & XP984) was issued by the Ministry of Supply on 2nd November 1960, meant to serve as evolution aircraft towards the realisation of a military design through the increase of engine power, accommodation of operational equipment and the development of wing design. The P.1127's first conventional flight took place on 13th March 1961, piloted by Bill Bedford, lasting 22 minutes. Among the crowd present for the event there was Sir Sydney Camm, George Anderson (Sales Manager), Roy Chaplain (Deputy Chief Designer) and Fred Sutton (Flight Test Manager). While a Hunter T.7 was chosen as chase plane for this flight, Hurricane PZ865/G-AMAU ('Last of the Many') was used for the transitional flight of the P.1127, due to its controllable speed range from 70 to 250 knots.

GOR.345 had, in the meantime, been replaced by NBMR-3, a scheme backed by NATO calling for a supersonic strike fighter. Hawker soon adapted the P.1127 design to qualify for such a specification, under the project number P.1154. Although the latter was never to achieve production status, experience gained in its planning contributed in no small way towards achieving a fully operational version of the P.1127. May of 1962 brought about an order for nine more aircraft (XS688-696). Through an agreement reached between Britain, the United States and West Germany, an evaluation squadron was established under the name of Tripartite Evaluation Squadron (TES) its CO being Wg Cdr D. Scrimgeour, RAF. This unit was based at West Raynham in 1964 and operated the Pegasus 5-powered version known as the 'Kestrel'. Operational flying began on 1st April 1965 and up to 30th November 1965 the trials generated a huge amount of data, including for the 938 take-offs and landings undertaken, which is a high figure considering the serviceability of the radical engine/airframe combination.

FROM KESTREL TO HARRIER

Another round of political axes fell on

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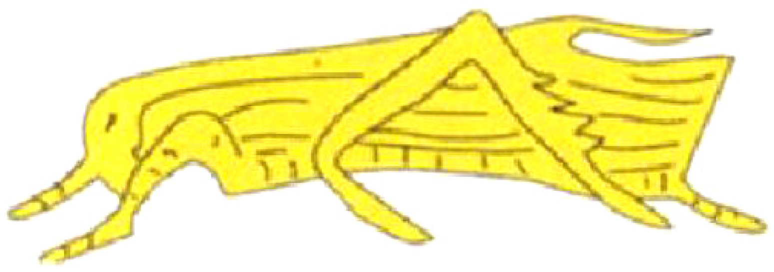
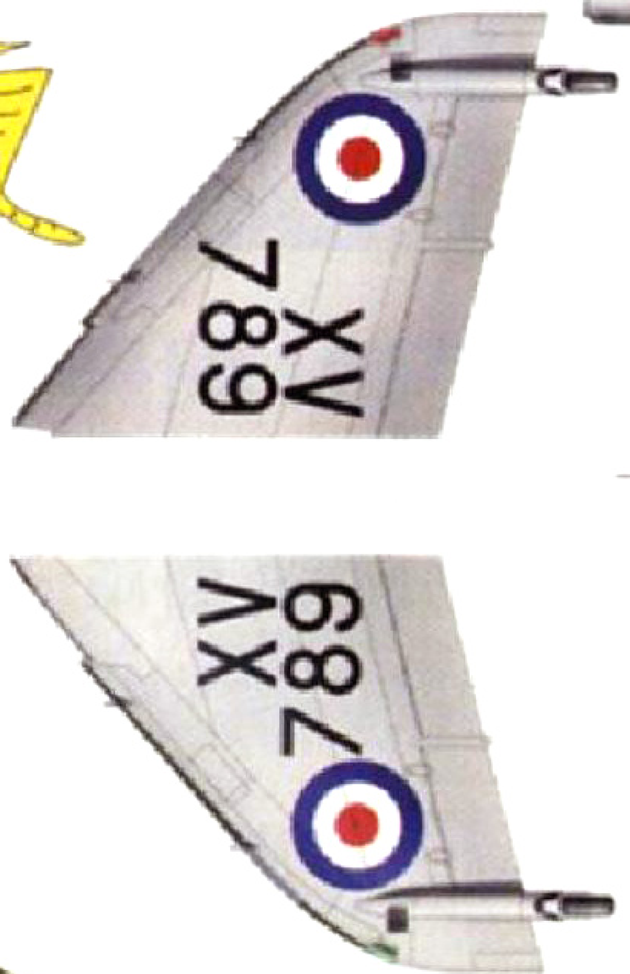
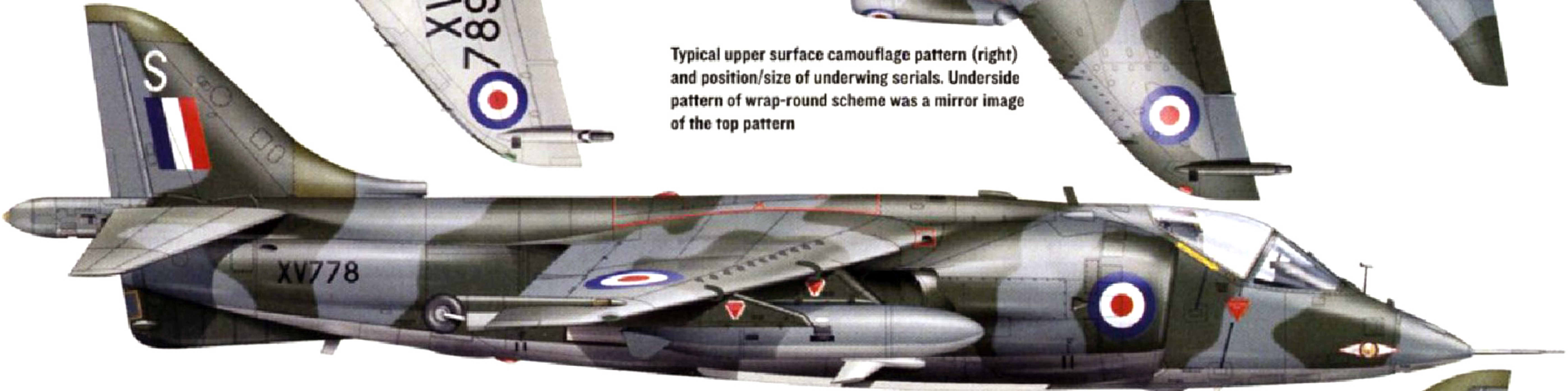
Hawker-Siddeley Harrier GR Mk I, XV760/60, Harrier Operational Conversion Unit (HOCU). Gloss Dark Sea Grey/Dark Green/Light Aircraft Grey finish with red/white/blue roundels in four positions; serial in black, repeated below wings. Code '60' on fin in red, outlined yellow; HOCU badge on nose





Typical upper surface camouflage pattern (right) and position/size of underwing serials. Underside pattern of wrap-round scheme was a mirror image of the top pattern



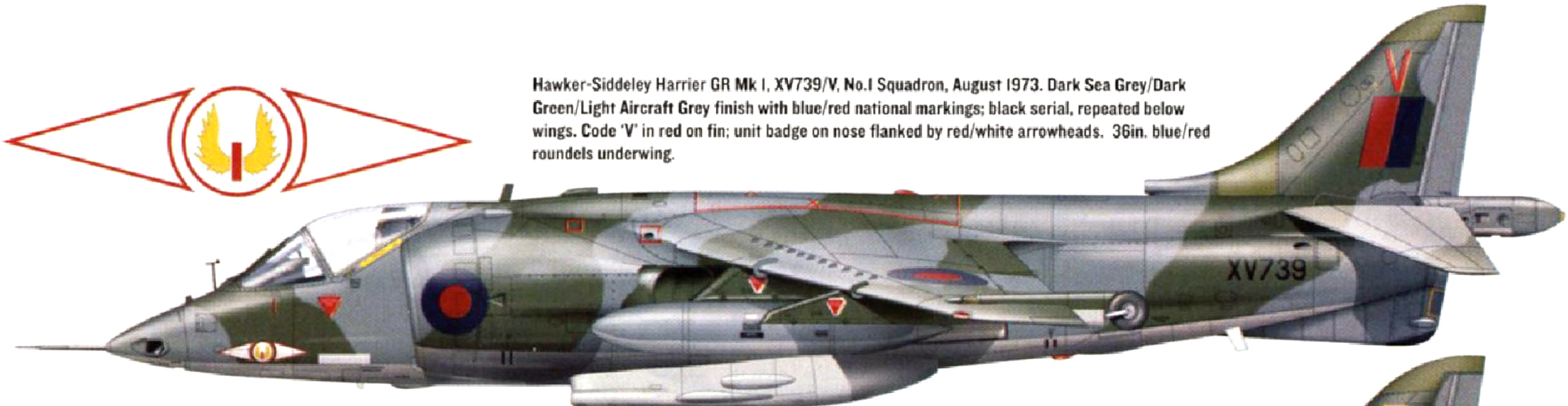
Above: Hawker-Siddeley Harrier GR Mk I, XV778/S, No. I Squadron, 1970. Gloss Dark Sea Grey/Dark Green/Light Aircraft Grey finish with red/white/blue roundels in six positions; serial in black, repeated below wings. Code 'S' in white on fin; unit badge on nose

Below: Hawker-Siddeley Harrier GR Mk I, XV751/51, Harrier Operational Conversion Unit (HOCU), 1971. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings; serial in black, repeated below wings. '51' on fin in red, outlined yellow; previous code (N) from No.I Squadron in red still visible on fin. HOCU badge on nose. 36in. diameter blue/red roundels under wing

Hawker-Siddeley Harrier GR Mk I, XV808/T, No.20 Squadron, August 1973. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings; black serial and code, the former repeated below the wings. Unit badge on nose flanked by light blue bars with red/white/green stripes at centre (note that eagle motif is not handed on this side)

Hawker-Siddeley Harrier GR Mk IA, XV758/39, No.233 Operational Conversion Unit, 31st May, 1974. Gloss Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings; serial in black, repeated below wings. Code '39' on fin in light blue; unit badge, flanked by grey/red/black/yellow bars, edged in pale blue, on nose. This aircraft was the first to have the then new No.233 OCU badge applied, in September 1973, just prior to its visit to Brazil. 36in. blue/red roundels underwing

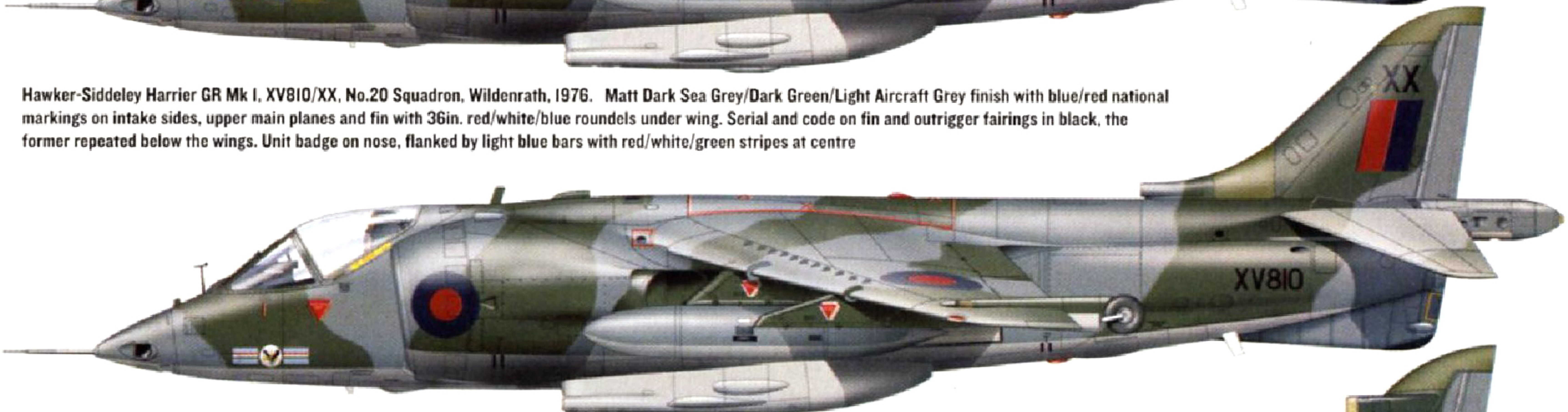
Hawker-Siddeley Harrier GR Mk I, XV739/V, No.I Squadron, August 1973. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings; black serial, repeated below wings. Code 'V' in red on fin; unit badge on nose flanked by red/white arrowheads. 36in. blue/red roundels underwing.



Hawker-Siddeley Harrier GR Mk I, XW767/F, No.3 Squadron, 1975. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings; black serial, repeated below wings. Code 'F' in yellow on fin; white nose cap and wingtips; unit badge on nose, flanked by green/yellow bars. When recorded at Malta it carried a No.III Squadron zap on the rear fuselage.

Hawker-Siddeley Harrier GR Mk I, XV747/G, No.4 Squadron, Gutersloh, 6th December 1975. Matt Dark Sea Grey/Dark Green/Light Aircraft Grey finish with Gloss nose cone. Blue/red national markings. Unit badge, flanked by yellow/red/black bars, on nose. 36in. blue/red roundels underwing from its days at RAF Wittering. Note the No.233 OCU badge "shadow" on the nose

Hawker-Siddeley Harrier GR Mk I, XV810/XX, No.20 Squadron, Wildenrath, 1976. Matt Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings on intake sides, upper main planes and fin with 36in. red/white/blue roundels under wing. Serial and code on fin and outrigger fairings in black, the former repeated below the wings. Unit badge on nose, flanked by light blue bars with red/white/green stripes at centre



Hawker-Siddeley Harrier GR Mk 3, XV810, No.20 Squadron, 15th October 1976. Dark Sea Grey/Dark Green/Light Aircraft Grey finish with blue/red national markings on intake sides, upper main planes and fin with 36in. red/white/blue roundels under wing. Black serial, repeated below wings. Code XX in black on outrigger fairings. Unit badge on nose, flanked by light blue bars, with red/white/green stripes at centre. Note US Marine Corps style aerial fitted for evaluation by the British Army in Germany

Hawker-Siddeley Harrier GR Mk 3, XW630, No.20 Squadron, Wildenrath, 1977. Dark Sea Grey/Dark Green wrap-round camouflage with blue/red national markings; serial in black, repeated below the wings. Unit badge on nose, flanked by light blue bars with red/white/green stripes at centre

Hawker-Siddeley Harrier GR Mk 3, XW922/44, No.233 Operational Conversion Unit (OCU), Leuchars, 25th June 1965. Dark Sea Grey/Dark Green wrap-round camouflage finish with blue/red national markings; black serial, repeated below wings. '44' on fin in light blue; unit badge, flanked by red/grey/yellow/black dicing (outlined in light blue) on nose. XW922 was the first No.233 OCU aircraft to be given the then new overall camouflage finish in May 1975. Note the lighter shade of Dark Green on the nose, this being a temporary finish of Acrylic "Ground Equipment" Dark Green over a repair to a bird strike which occurred that morning. 36in. Blue/Red roundels under wing.

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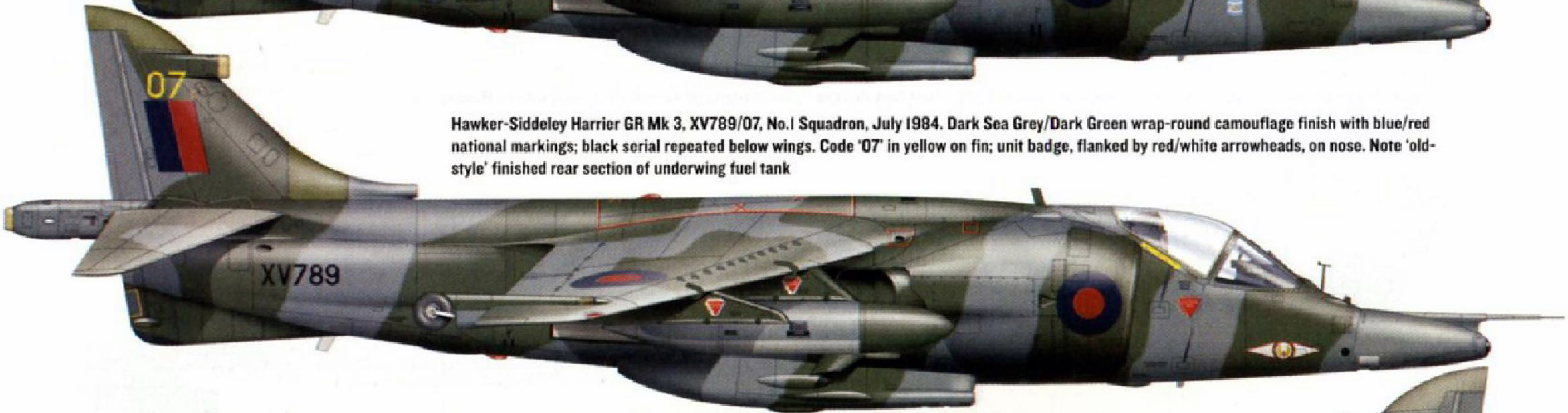
Hawker-Siddeley Harrier GR Mk 3, XV752/M, No.1417 Flight. Dark Sea Grey/Dark Green wrap-round camouflage finish with blue/red national markings; black serial, repeated below wings. Code 'M' in white; unit badge, flanked by red/blue bars, on nose

Hawker-Siddeley Harrier GR Mk 3, XV778/H, Falkland Islands Detachment, 1983. Dark Sea Grey/Dark Green wrap-round camouflage finish with blue/red national markings; serial in black, repeated below wings. Code 'H' in yellow on fin; unit badge below windscreen



Hawker-Siddeley Harrier GR Mk 3, XV789/07, No.1 Squadron, July 1984. Dark Sea Grey/Dark Green wrap-round camouflage finish with blue/red national markings; black serial repeated below wings. Code '07' in yellow on fin; unit badge, flanked by red/white arrowheads, on nose. Note 'old-style' finished rear section of underwing fuel tank

Hawker-Siddeley Harrier GR Mk 3, XV738/B, No.4 Squadron, Gutersloh, 1984. Dark Sea Grey upper surfaces and Medium Sea grey undersides; serial in dark grey, code 'B' in light grey on fin. Unit badge and flanking bars in monochrome shades replacing the original colours; blue/red national markings of reduced size. Experimental scheme used for Operation Match-Coat, comparison and evaluation against all-green XV809 of No.3 Squadron

Hawker-Siddeley Harrier GR Mk I, XZ993/M, No.4 Squadron, Gutersloh, September 1989. Dark Sea Grey/Dark Green wrap-round camouflage finish with blue/red national markings; black serial, repeated below wings. Black/red fin and rudder with yellow flash and code 'M' superimposed; unit badge, flanked by red/black bars, with yellow outline and lightning flashes

a number of aviation projects under development in January 1965, one of which was the P.1154. In compensation, ASR.384 was issued calling for a P.1127 development for use by the Royal Air Force (RAF). This was followed later that same year with an order for six pre-production aircraft, named 'Harrier' (XV276-281), the first of which flew in August 1966. Although resembling the Kestrel in many ways, the Harrier was virtually a new aircraft and its engineering can only be described as ingenious. For the first time ever, an aircraft was designed and built in such a way that every single panel in the fuselage, every wing and any of its panels, flap, aileron, wing tip, fin and all its panels, canopy, nose cone and every access door could be removed from one aircraft and bolted, screwed or riveted onto another without adjustment of any kind; and as if to emphasise this, access panels on early Harriers had clearly stamped on the inside the words 'Checked for Interchangeability'!

Powered by the Pegasus Mk 6, which was now providing 19,000lb of thrust, the first four aircraft in this batch (XV276-297) were built with Kestrel-type fairings in front of the cold nozzles while the other two featured the later type of air intake fairings. All aircraft had the rectangular style intake and exhaust fairing on the forward engine bay doors for the twin 4kVA engine mounted alternators. Modellers should note that these aircraft were finished in gloss polyurethane Dark Green/Dark Sea Grey/Light Aircraft Grey and carried 36in. diameter red/white/blue roundels on upper and lower surfaces of the wings together with a 24in. red/white/blue roundel on the intake sides (centred on No.5 auxiliary intake door) and fin flashes in the same colours. Serials were in standard 8in. black characters on the rear fuselage, repeated below the wings in 20" high characters.

The pre-production run was followed by an initial batch of Harrier GR Mk Is to full operational specification, made up of two batches. The first consisted of serial XV738-762, all of which were similarly finished to the first six aircraft described above. XV742 flew for a while with civil registration G-VSTO for a sales mission to Switzerland. This was followed by a second batch (XV776-810) but this time there was a change of markings believed to have begun with XV795. Air Staff policy had changed and lower visibility national markings were now required. These consisted of 24in. diameter red/blue roundels on the intake sides while those above the wings (in the same colours) were reduced from 36in. diameter to 30in. and officially moved outboard by some two inches so that the outer edge of the red disc abutted against the outer edge of the Aileron Power Control Unit (PCU) access panel. Fin flashes were also changed to red/blue while roundels beneath the wings remained as before. XV743 crashed prior to delivery to the RAF and was replaced by XW630.

A second production batch of Harrier GR Mk Is consisted of XW754-770. Due to a possible conflict of identification between XW754-762 with part of the first production batch (XV754-762) the former were re-serialled XW916-924.

A Harrier Conversion Team (HCT) was formed on 1st January 1969, led by Sqn Ldr R.H.B. Le Brocq, spending the first three months with Hawker Siddeley at Dunsfold. Following the HCT to Wittering on 1st April, the first pair of GR Mk Is arrived on 17th and 18th May with the first conversion course for No.1(F) Squadron pilots beginning on 14th July, without the use of a simulator or a two-seat trainer; these were preceded by sorties whereby pilots became accustomed to VTOL techniques flying a Westland Whirlwind helicopter. On 1st April of the following year, the HCT became the Harrier Conversion Unit until another change in name that came on 1st October when it became officially known as No.233 Operational Conversion Unit (OCU).

Living up to its motto (*Foremost in Everything*) No.1(F) Squadron RAF was given the task of proving the Harrier in operational service when it moved from West Raynham to Wittering in June of the same year. As can be expected of such a revolutionary machine, conversion was a long process and characterised by a number of problems. However, once these had been overcome the squadron championed the Harrier's unique qualities wherever it went. The unit's first overseas deployment was in March 1970 at Akrotiri (Cyprus), staging through Malta where yours truly gaped in utter amazement to see the aircraft landing and taking off in the length of a football pitch.

Second unit to be equipped with the Harrier was No.4(AC) Squadron RAF, which moved from Gutersloh, first to Wittering in March 1970 for conversion to the Harrier and then to Wildenrath where it received its first GR Mk Is (XV779, 780) on 22nd June. Second RAF Germany unit to pass onto the Harrier GR Mk I was No.20, becoming officially operational on 1st December 1970.

Meanwhile Pegasus development and production had passed on to Rolls-Royce (following a Bristol-R.R. merger) from where the Pegasus 102 of 20,000lb thrust appeared. These engines were retrofitted to all GR Mk Is and with it came a change in designation to GR Mk 1A. XW916-924 were built as Mk 1As and finished on the production line in matt Dark Sea Grey/Dark Green/Light Aircraft Grey while other Harriers in service began to receive the same matt finish. Markings remained the same as those for the last batch of GR Mk Is, described above. These aircraft were produced as GR Mk 1As, but powered by the Pegasus 103 (21,000lb thrust) but still retaining the twin 4kVA alternators. Problems with Rotax 12kVA alternators planned for the 103 meant that some Pegasus engines of this type were only partially upgraded to the required standard.

XP976, one of the four development P.1127 Kestrels; the others being XP972, XP980, XP984. Note the original design of the wings (via Dennis Robinson)

Apart from upgrading Harriers already in the field, a fourth unit, No.3 Squadron, was formed in January 1972 at Wildenrath on the GR Mk 1A thus completing the Wildenrath Wing of three squadrons. A further upgrade of Harriers to GR Mk 3s involved the installation of the new Pegasus 103, while a further batch of Harriers (XZ128-139) to this standard was produced. These first GR Mk 3s were delivered complete with LRMTS (Laser Ranging And Marked Target Seeking) nose and PWR (Passive Warning Radar) tail. Another external modification was the increase in height of the fin tip by some six inches. By that time the external finish had been standardised with the application of the three matt colours and two-colour national markings (with the exception of roundels below the wings that remained in red/white/blue). A final production run of GR Mk 3s consisted of XZ963-973 and XZ987-999. These appeared in the 'wrap-round' finish of matt Dark Sea Grey and Dark Green, with two-colour national markings in all positions. It has been noted that XZ963-973 were issued with stencil-style serial numbers on the rear fuselage.

FAR AWAY FROM BRITISH SHORES

Harriers from No.1(F) Squadron were flown to Belize (ex-British Honduras) when that Central American state was under threat of invasion by Guatemala. Six GR Mk Is arrived there on 5th November 1975 but returned to the UK the following April as tensions eased. Barely a year later they were back and formed a permanent detachment in July 1977, and received the designation of No.1417 Flight in January 1979. This time the aircraft were GR Mk 3s, both machines and pilots being supplied in three-month rotation by RAF squadrons based in Europe until the arrival of the GR Mk 5 late in 1980s.

The contribution of No.1(F) Squadron Harriers during the Falklands campaign merits a full feature to do it justice. It would be enough to mention, in this short space available, that the ten aircraft from this unit that participated in this short war were required to be modified in record time in a number of ways, including the ability to carry and fire Sidewinder missiles. Their pilots had also to undergo a crash training session of ski-jump procedures at Yeovilton, and then had to fly non-stop for 4,600 miles to catch up with their vessel, 'Atlantic Conveyor'. While they retained their normal camouflage and markings, all unit markings were deleted.

Following the recapture of the Falkland Islands, No.1(F) Squadron remained on station with a flight at RAF Port Stanley. At first it carried the name of Harrier Detachment Flight (HDF). On 10 November 1982 No.4(AC) Squadron took over these duties, followed by No.3(F) and No.20 Squadrons, and No.233 OCU in rotation every three months. Eventually the HDF became known as No.1453 Flight and remained in operation until the opening of Mount Pleasant on 2nd May 1985, when the flight was disbanded.

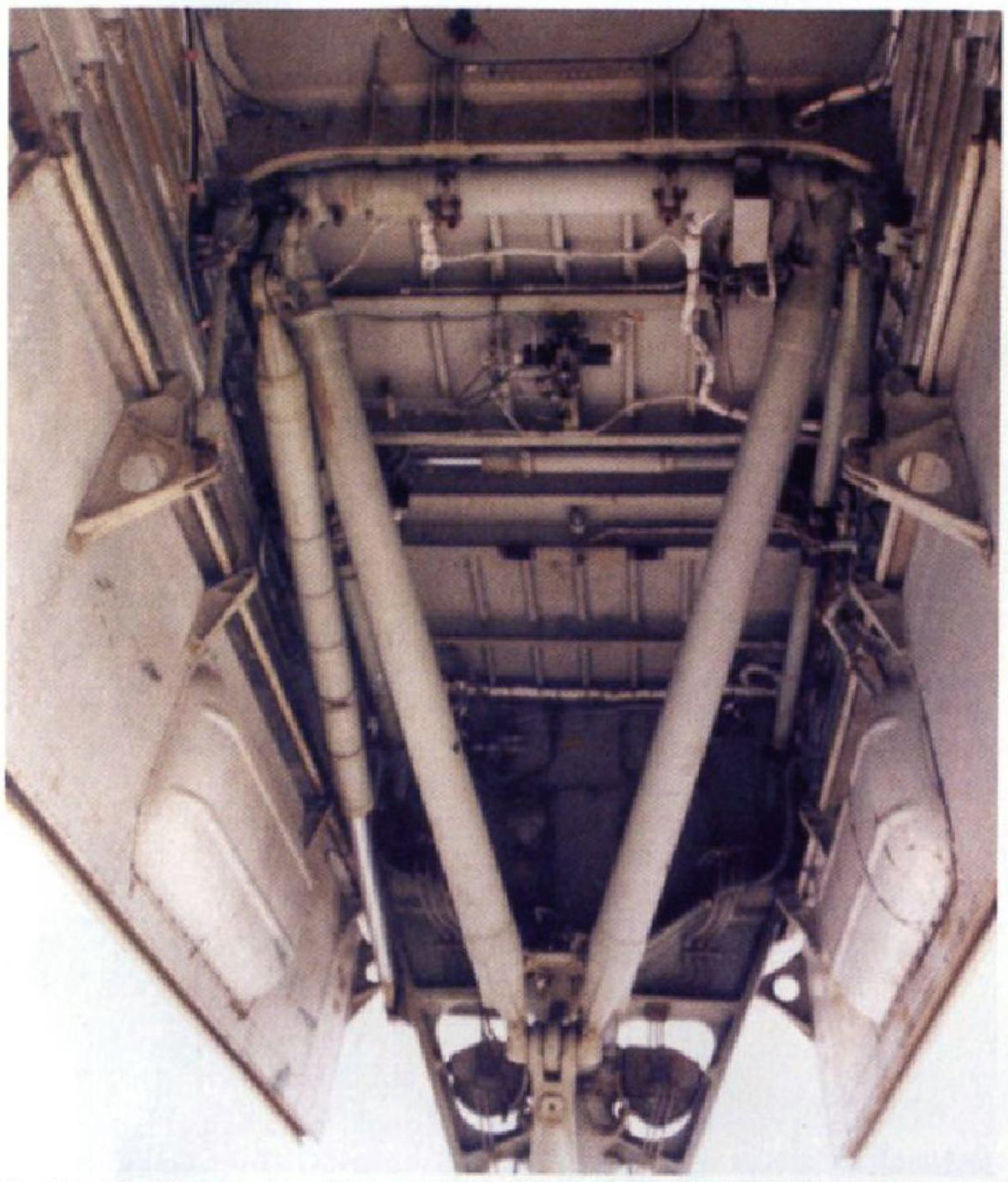
This is by no means the end of the Harrier story. Hopefully, in the not too distant future, we shall examine more versions of this revolutionary aircraft, and also take a close look at its early export and two-seat versions. ■

ACKNOWLEDGEMENT

My sincere gratitude to an old acquaintance, Dennis Robinson of IPMS(UK), Harrier Special Interest Group (http://harrier.hyperlinx.cz) who so generously contributed with his personal notes, photos and recollections to this feature. More information about modelling the Harrier can be found on the link above.

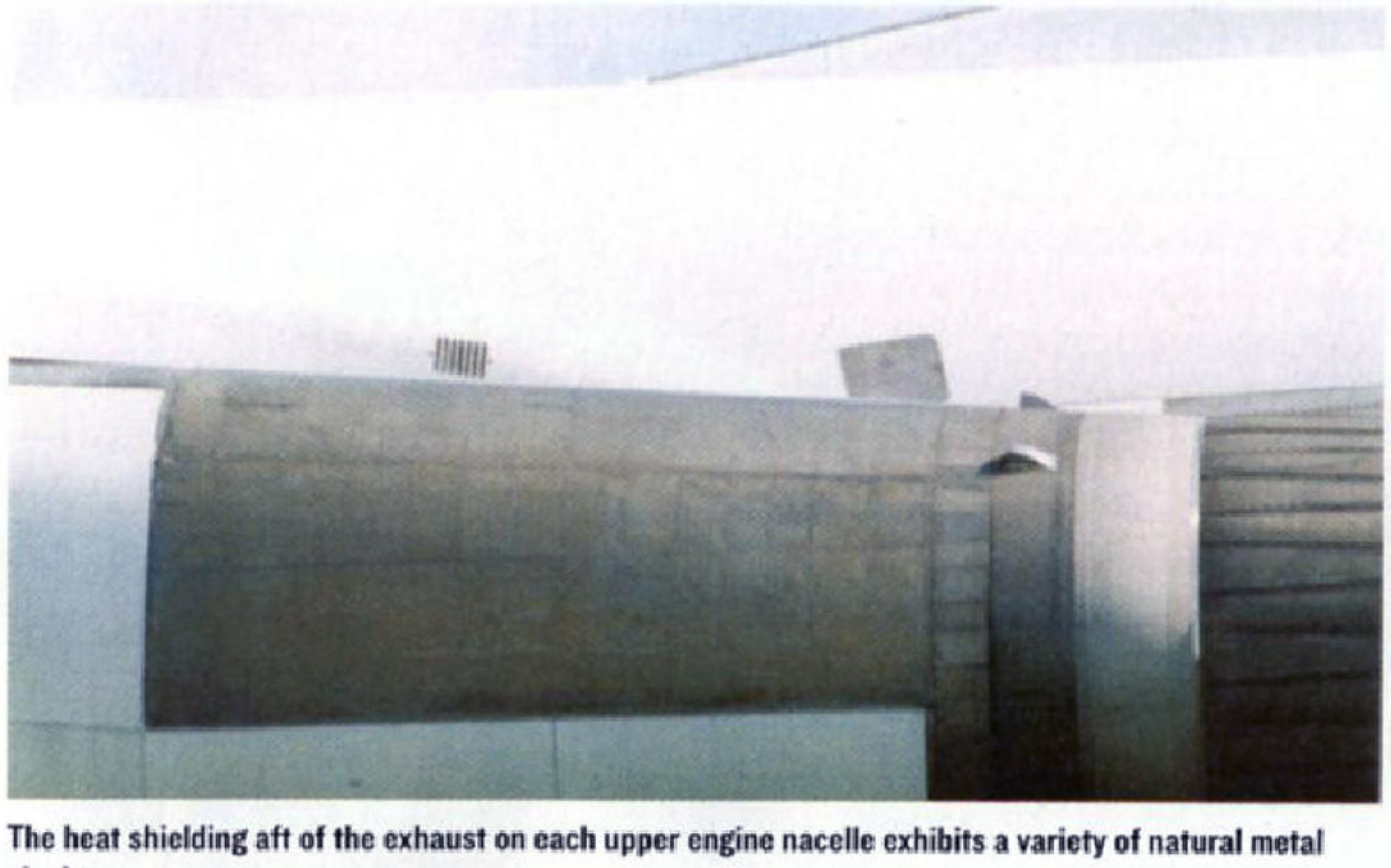
PHOTO ALBUM

This selection of images, by Ken Duffey, should help you add a few details to your Blackjack in those areas that would otherwise look a bit bare if made from-the-box © K. Duffey 2008

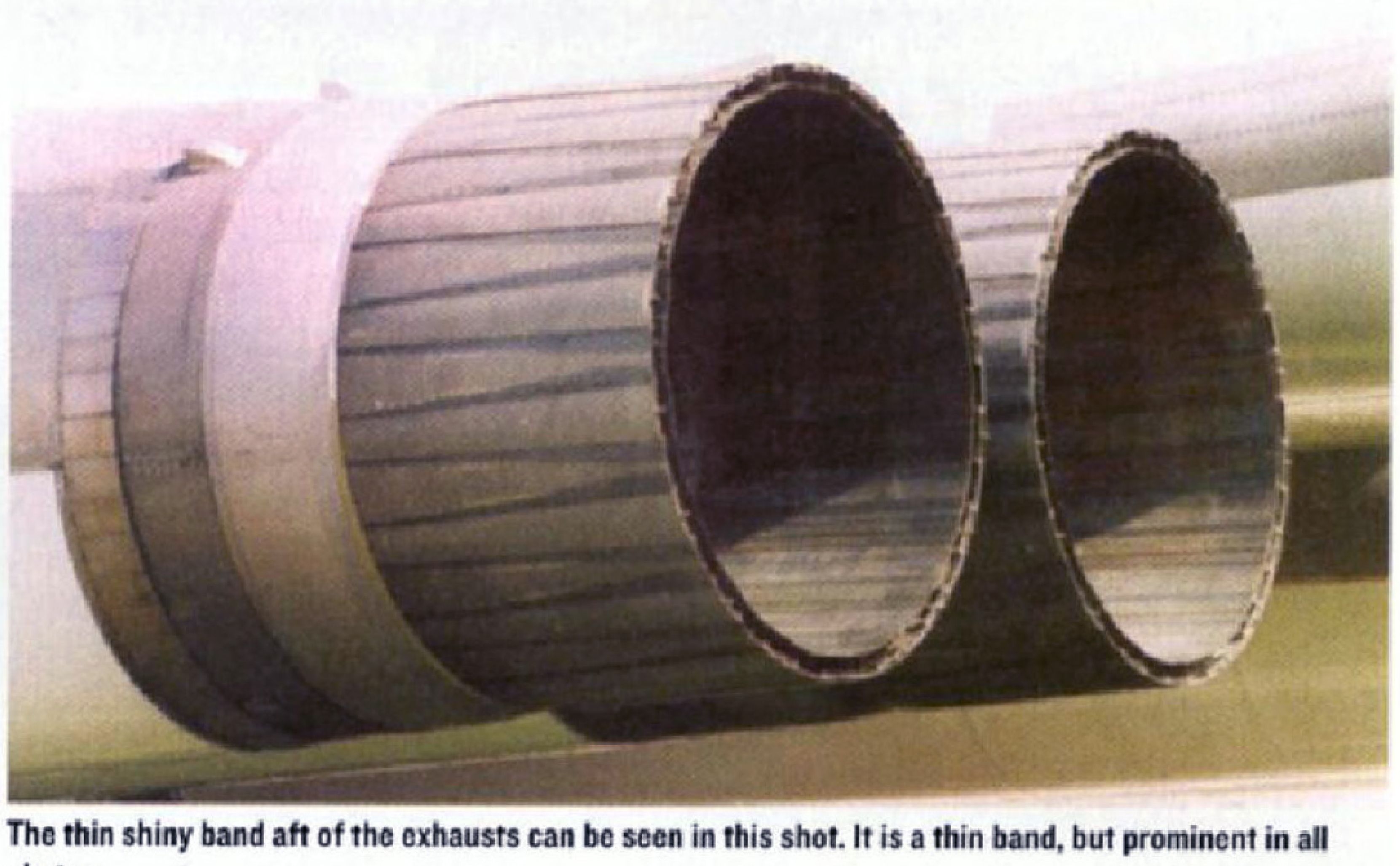


Here is a view of the rear section of the nosewheel well on a current Tu-160 photographed recently at Zhukovsky. The access hatch that comes up in front of the crew's toilet can be seen to the top

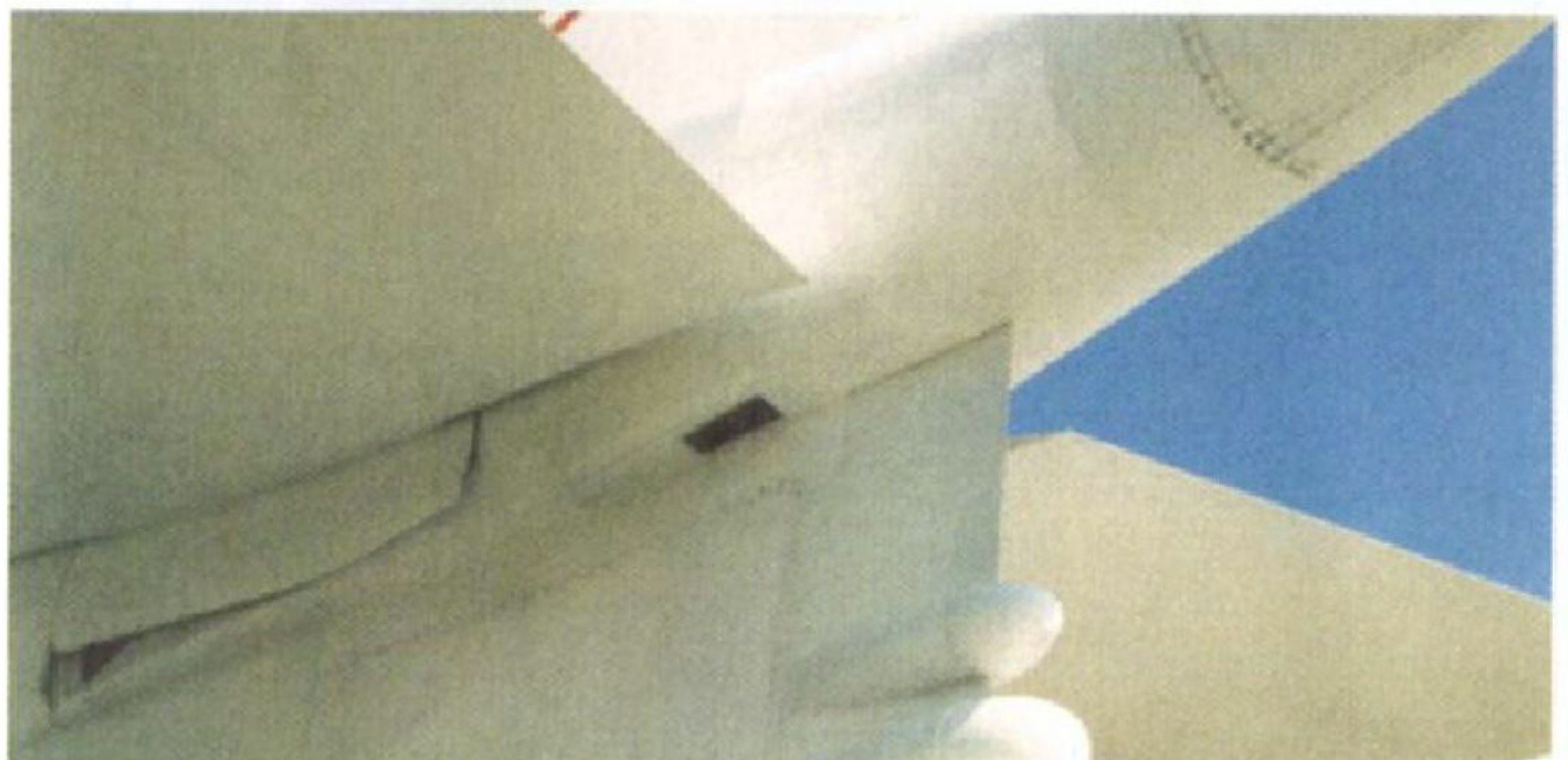
One of the main undercarriage legs, showing that this assembly is not dark grey but dark metallic grey for the main central leg, light silver for the upper section and light grey for all the other struts



The heat shielding aft of the exhaust on each upper engine nacelle exhibits a variety of natural metal shades



The thin shiny band aft of the exhausts can be seen in this shot. It is a thin band, but prominent in all photos



This shot shows you the shape of the plate that rotates with the stabiliser, just like a Harrier

This shot up into the hinge area of the starboard wing illustrates the big hydraulic ram in this area, as well as the droop to the inboard flap

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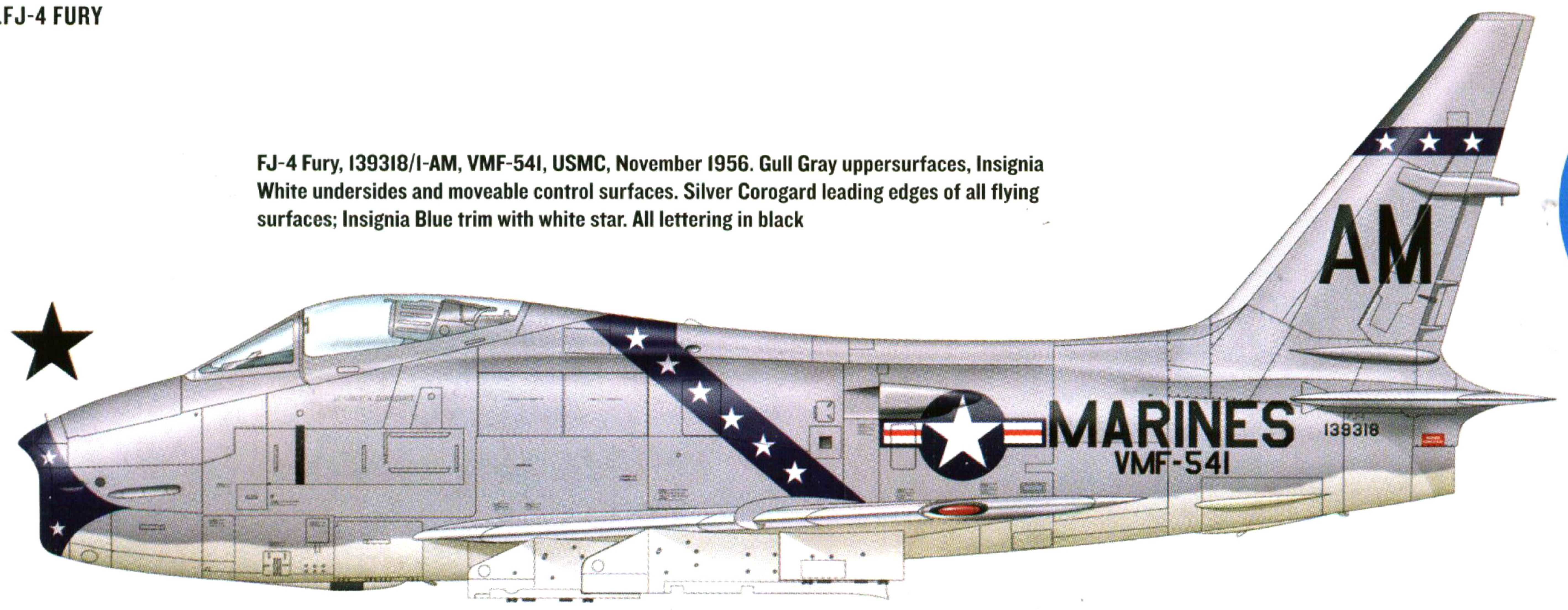
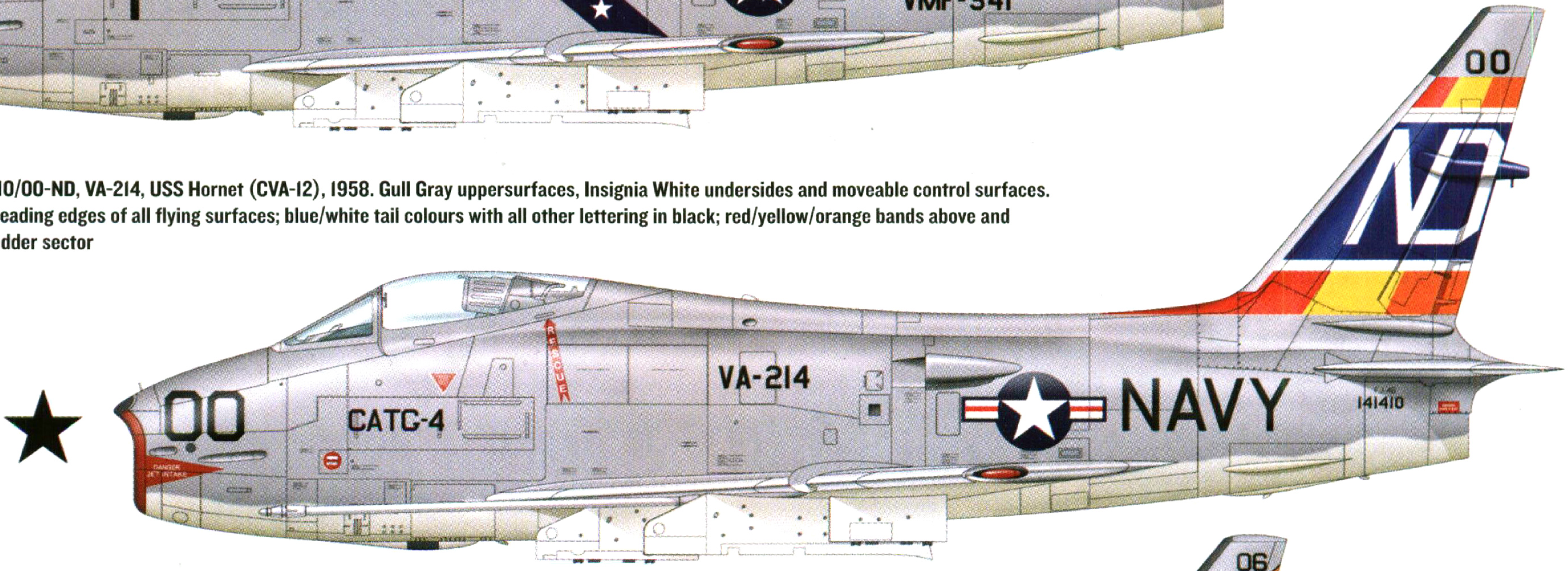
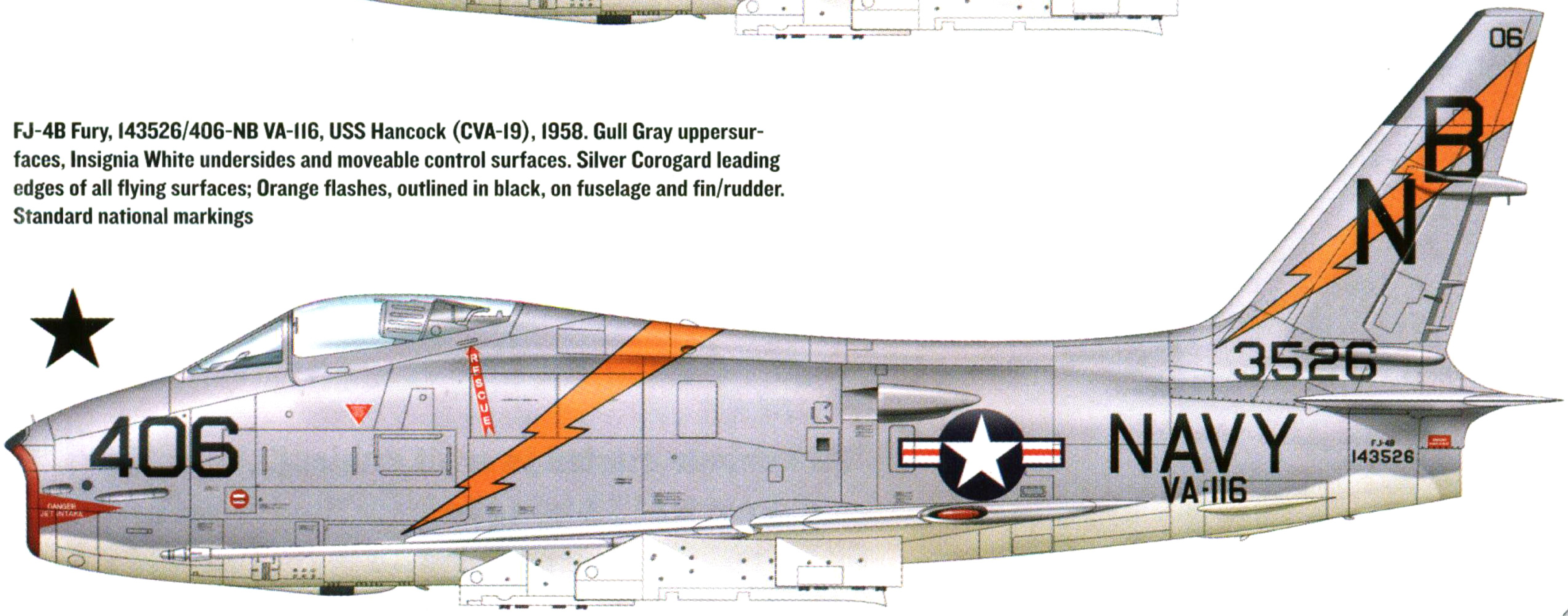
FJ-4 Fury, 139318/1-AM, VMF-541, USMC, November 1956. Gull Gray uppersurfaces, Insignia White undersides and moveable control surfaces. Silver Corogard leading edges of all flying surfaces; Insignia Blue trim with white star. All lettering in black

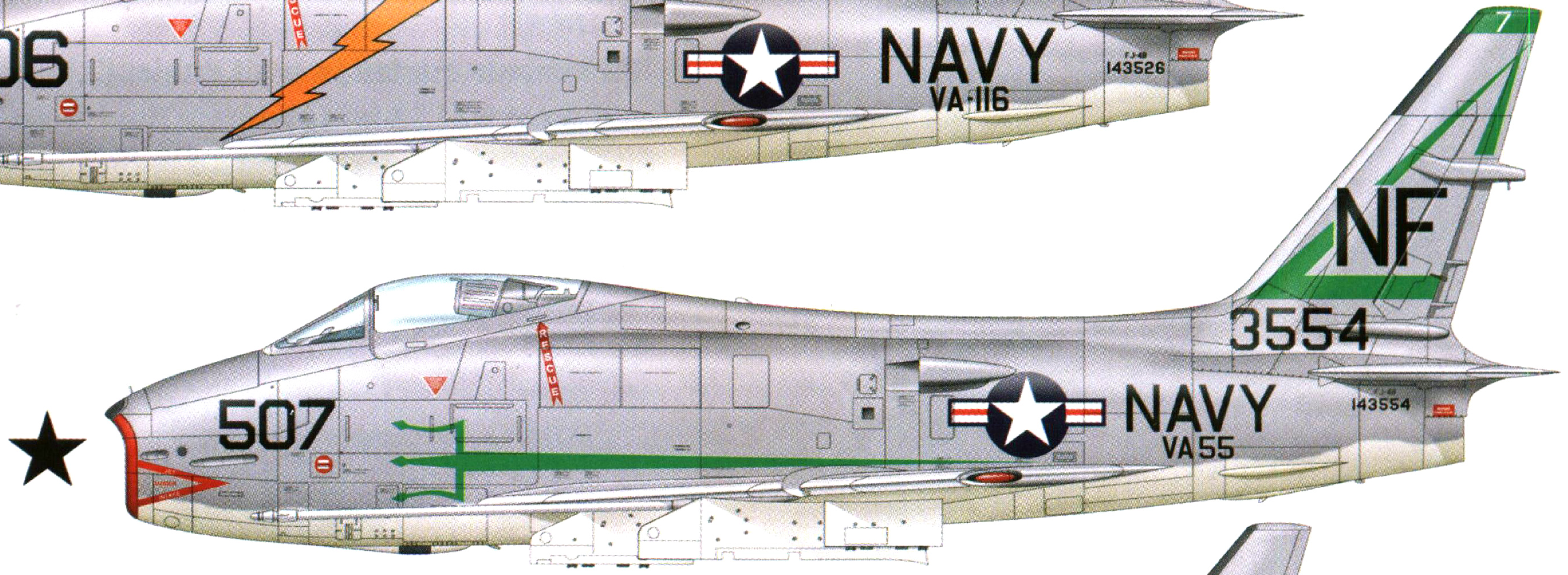


FJ-4B Fury, 141410/00-ND, VA-214, USS Hornet (CVA-12), 1958. Gull Gray uppersurfaces, Insignia White undersides and moveable control surfaces. Silver Corogard leading edges of all flying surfaces; blue/white tail colours with all other lettering in black; red/yellow/orange bands above and below blue fin/rudder sector



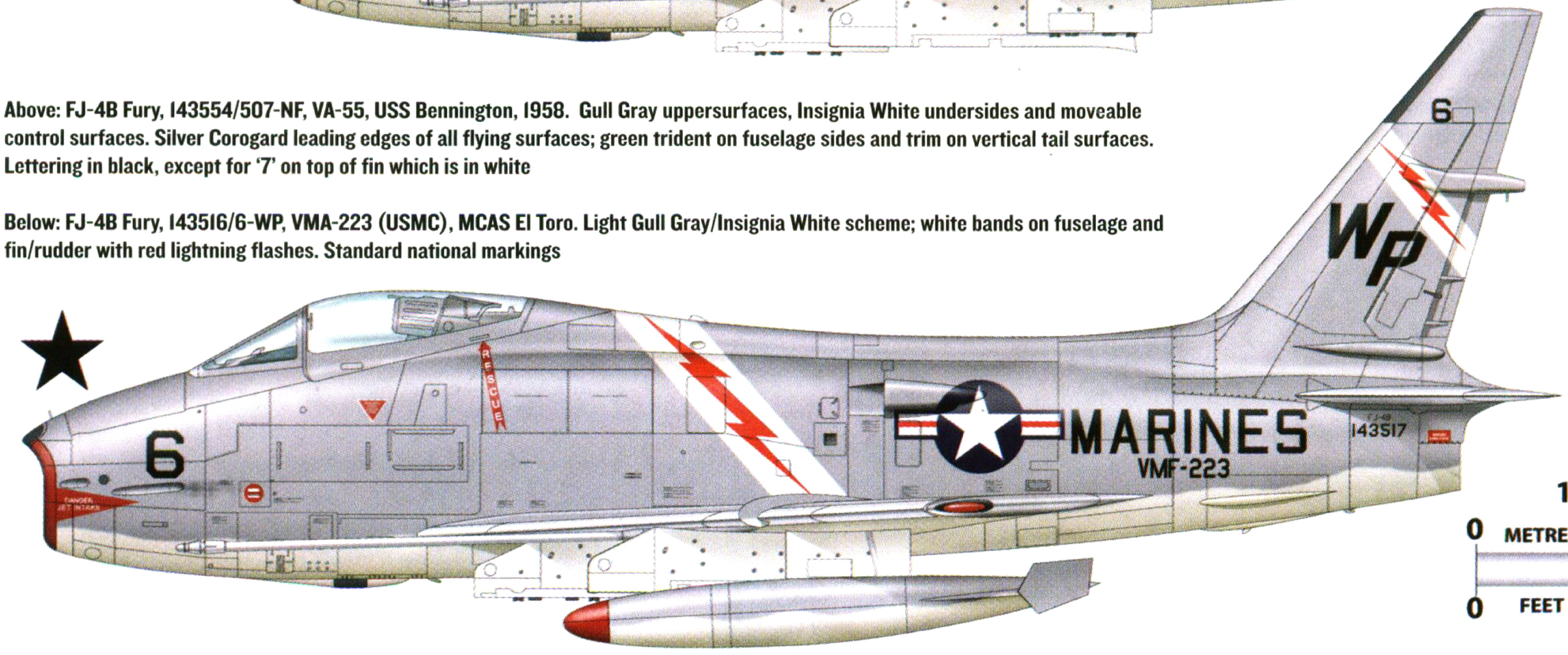
FJ-4B Fury, 143526/406-NB VA-116, USS Hancock (CVA-19), 1958. Gull Gray uppersurfaces, Insignia White undersides and moveable control surfaces. Silver Corogard leading edges of all flying surfaces; Orange flashes, outlined in black, on fuselage and fin/rudder. Standard national markings



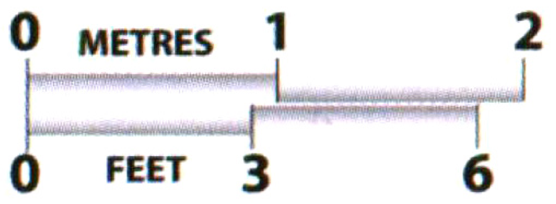


Above: FJ-4B Fury, 143554/507-NF, VA-55, USS Bennington, 1958. Gull Gray uppersurfaces, Insignia White undersides and moveable control surfaces. Silver Corogard leading edges of all flying surfaces; green trident on fuselage sides and trim on vertical tail surfaces. Lettering in black, except for '7' on top of fin which is in white

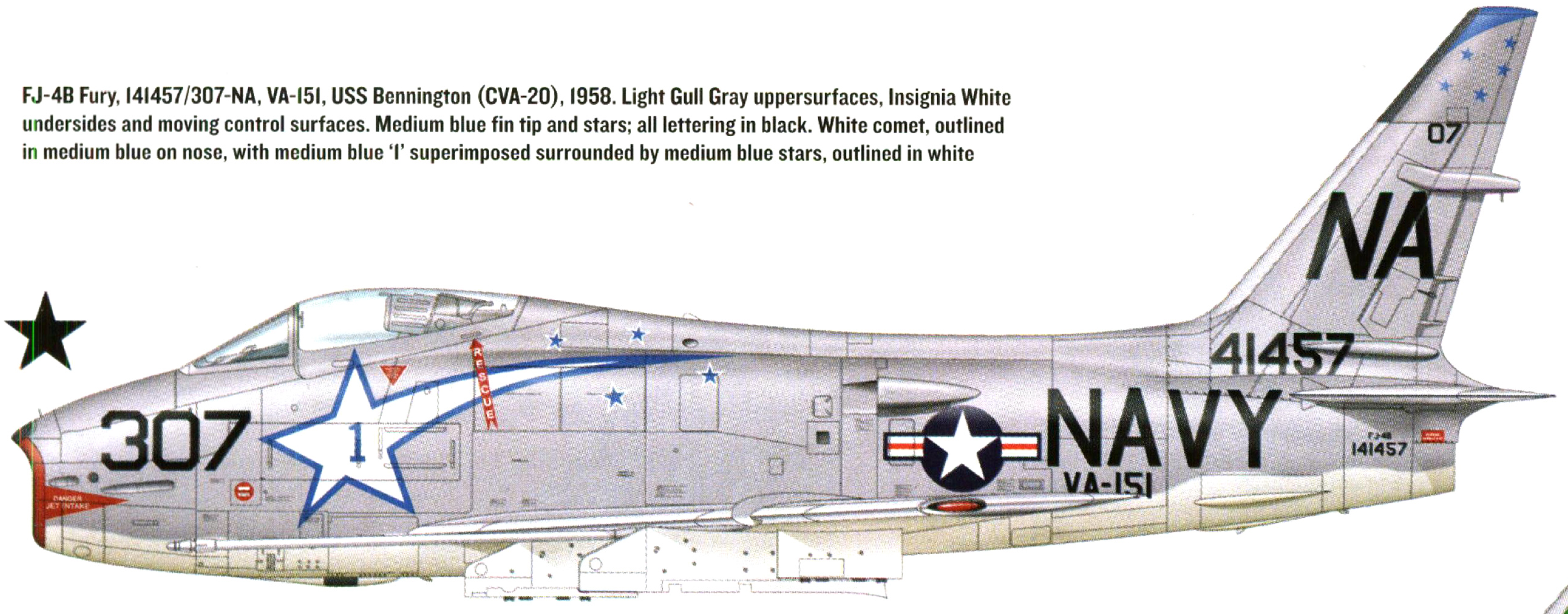
Below: FJ-4B Fury, 143516/6-WP, VMA-223 (USMC), MCAS El Toro. Light Gull Gray/Insignia White scheme; white bands on fuselage and fin/rudder with red lightning flashes. Standard national markings

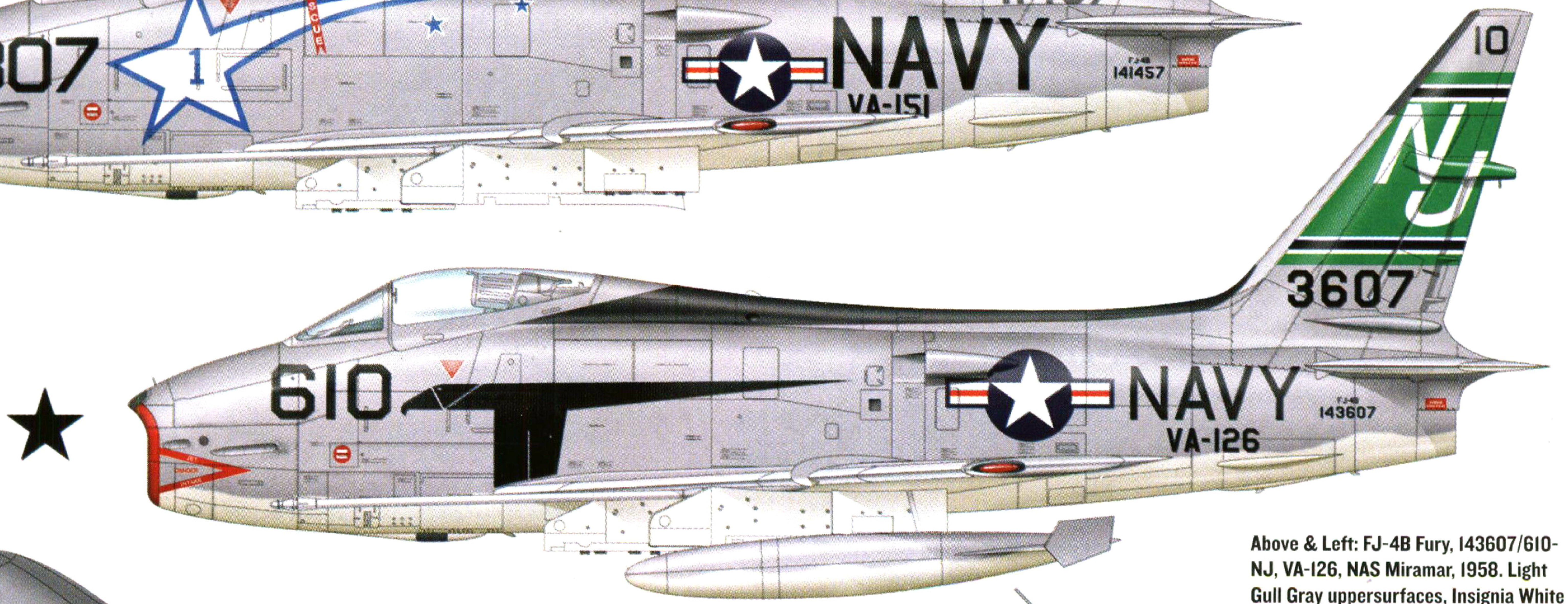


1:72 Scale

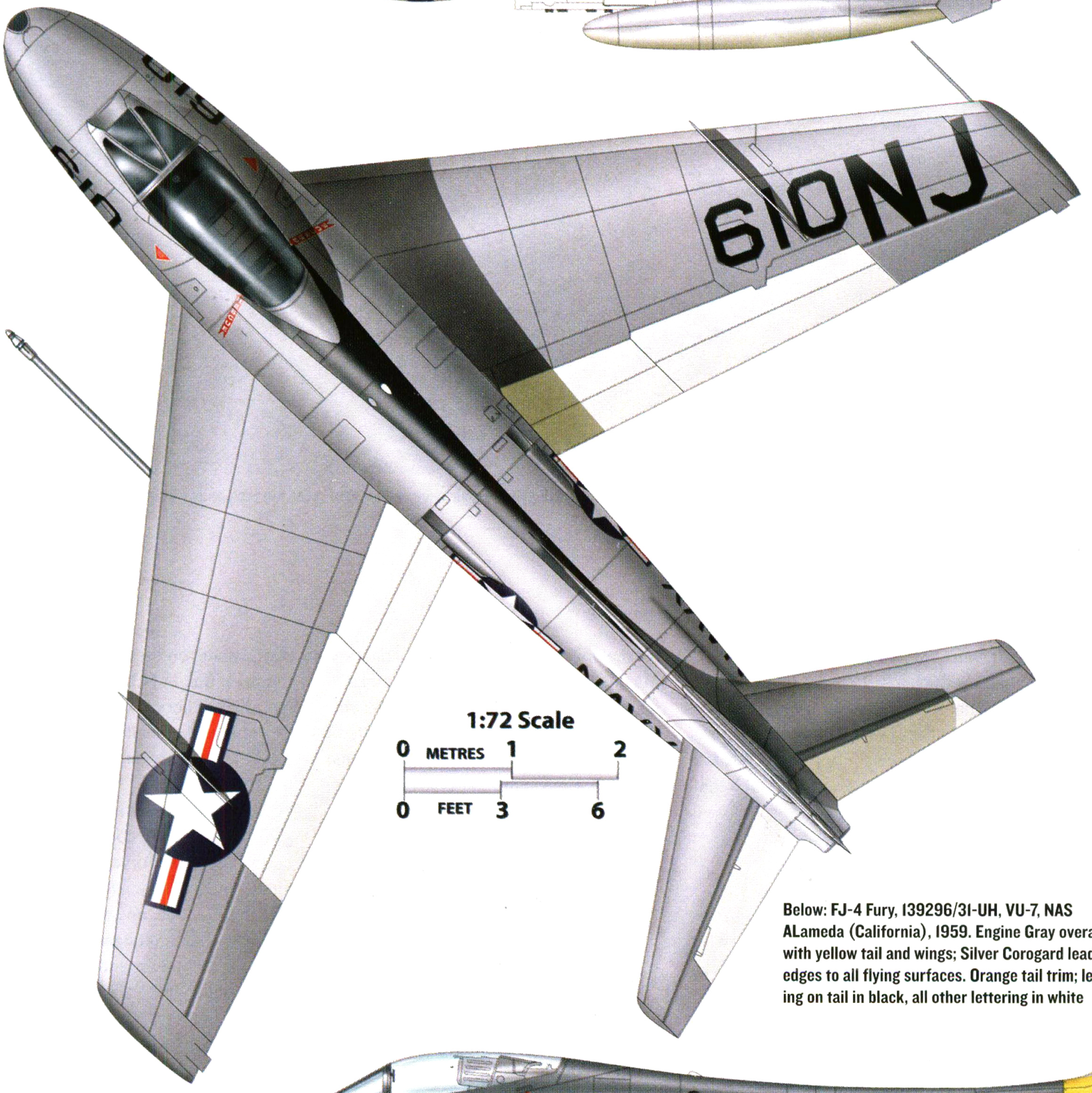


FJ-4B Fury, 141457/307-NA, VA-151, USS Bennington (CVA-20), 1958. Light Gull Gray uppersurfaces, Insignia White undersides and moving control surfaces. Medium blue fin tip and stars; all lettering in black. White comet, outlined in medium blue on nose, with medium blue 'I' superimposed surrounded by medium blue stars, outlined in white

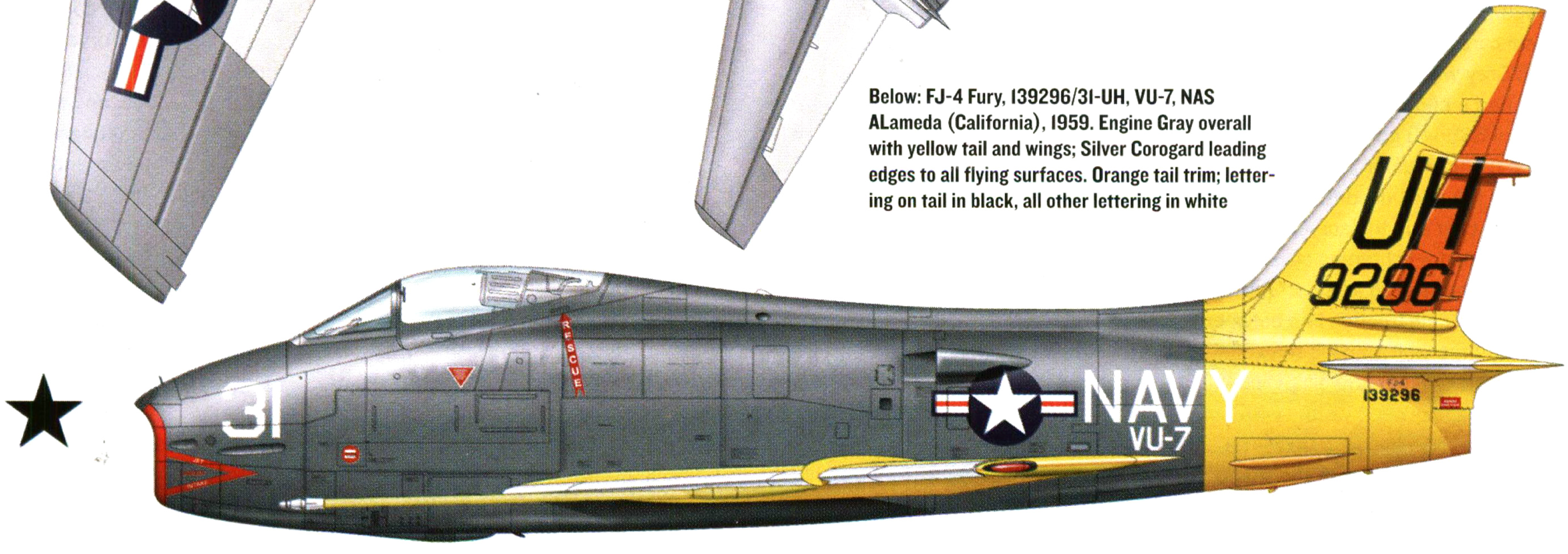




Above & Left: FJ-4B Fury, 143607/610-NJ, VA-126, NAS Miramar, 1958. Light Gull Gray uppersurfaces, Insignia White undersides and moving control surfaces. Mid-green fin/rudder with black/white bars; black fuselage 'bird' and spine. 'NJ' in white, rest of lettering and numbers in black; standard national markings



Below: FJ-4 Fury, 139296/31-UH, VU-7, NAS ALameda (California), 1959. Engine Gray overall with yellow tail and wings; Silver Corogard leading edges to all flying surfaces. Orange tail trim; lettering on tail in black, all other lettering in white

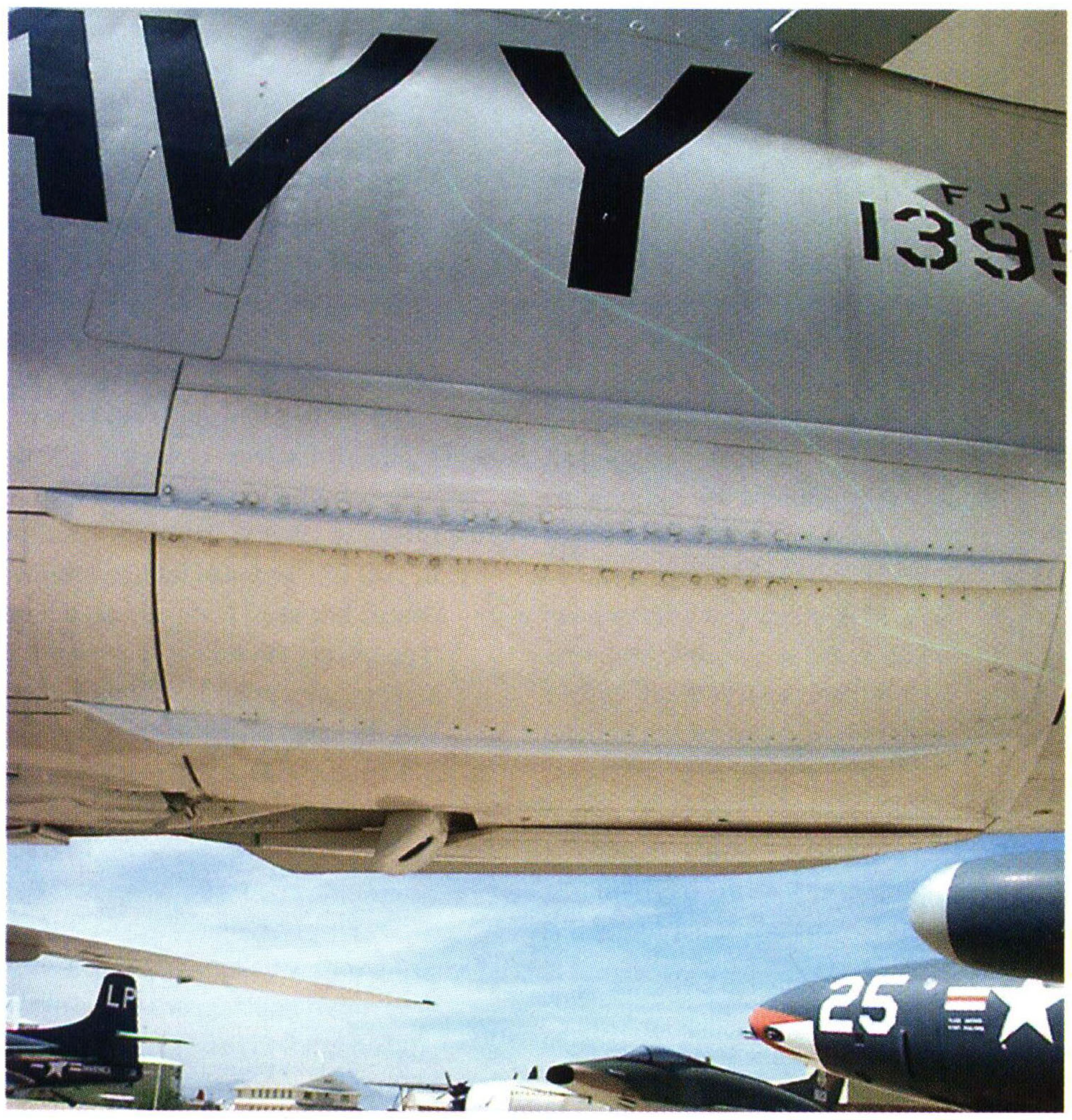


The main gun port, in this instance on the starboard side of the nose

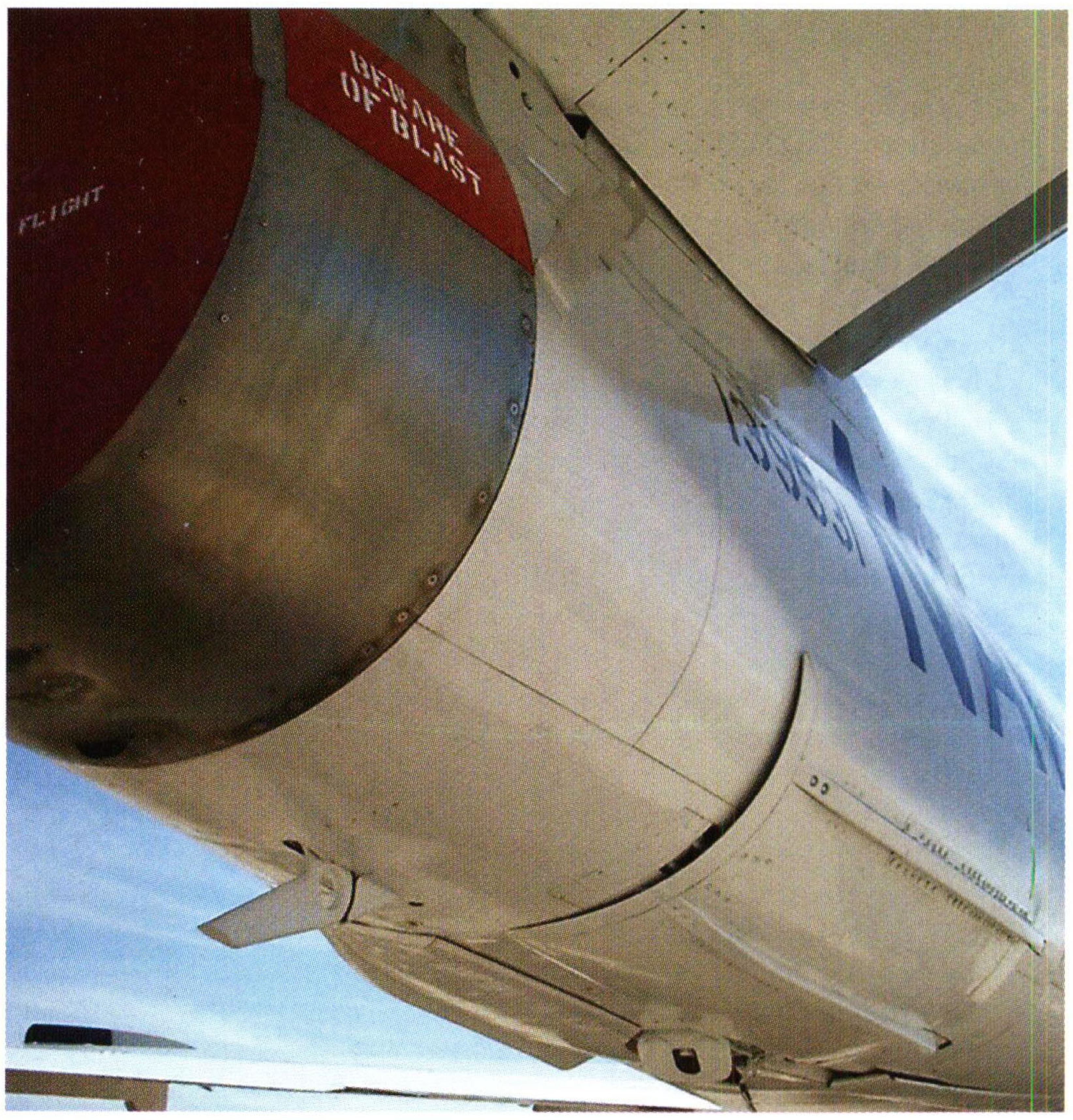
The nosewheel door has the prominent landing light mounted into it

1:1 REFERENCE

These images depict the FJ-4B at the Pima Air Museum in the USA. As a -4B the airframe is identical to the Hobby Boss kit as moulded, but NOT to the -4 version that it is supposed to depict in this particular boxing. However the images are useful for both versions, and when only applicable to the -4B it will be noted. All photos © George Papadimitriou



Further aft under the rear fuselage are these additional airbrakes; these apply ONLY to the -4B version



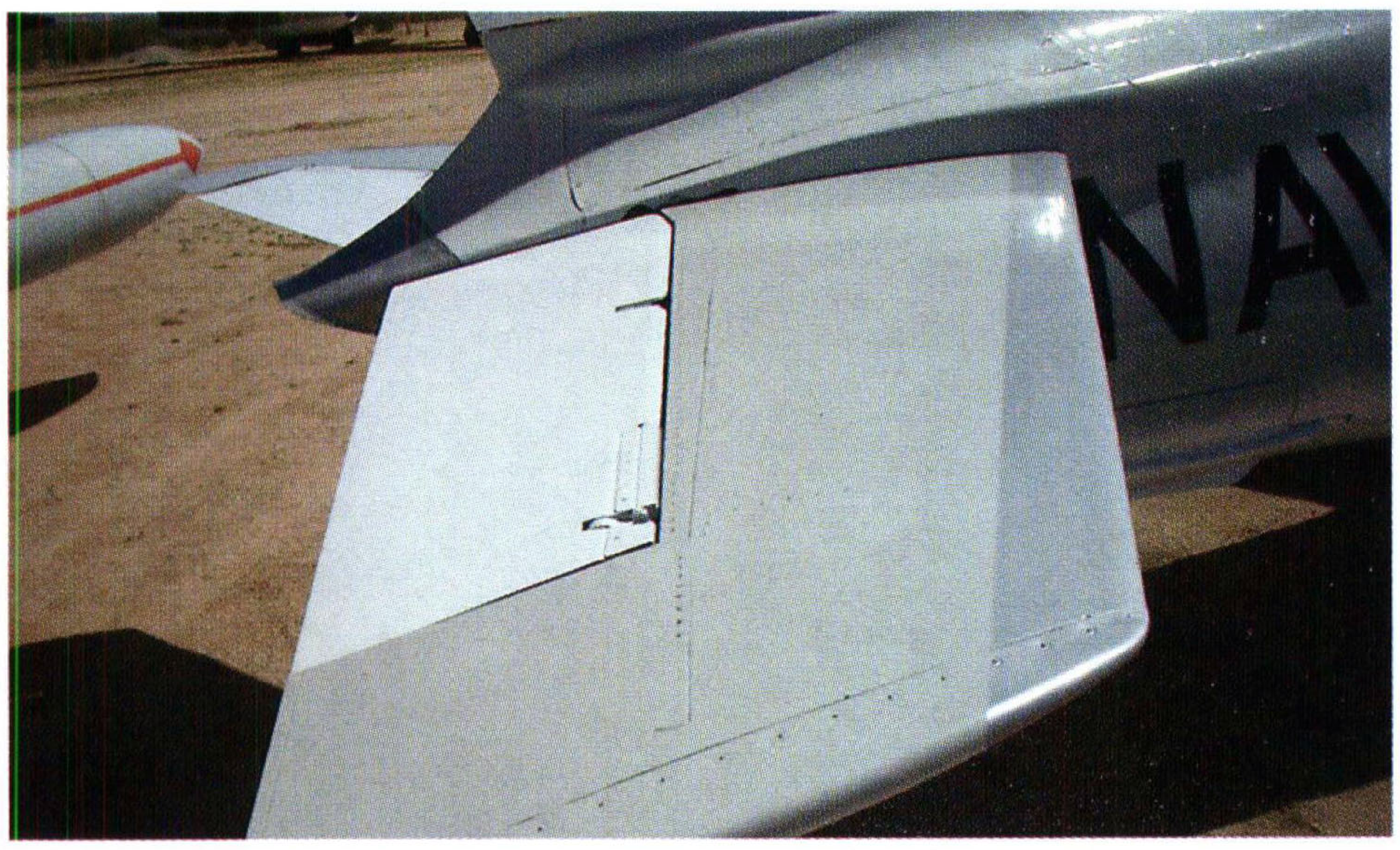
A useful shot under the rear fuselage, showing the ventral airbrakes (-4B only), the arrestor hook and the fuel dump pipe. You can also see into the all-moving tailplane mechanism at its root

This view of the port side of the nosewheel oleo and wheel shows the various small details in this area omitted from the kit

The air brakes on the lower fuselage on the port side, which apply to both -4 and -4B versions

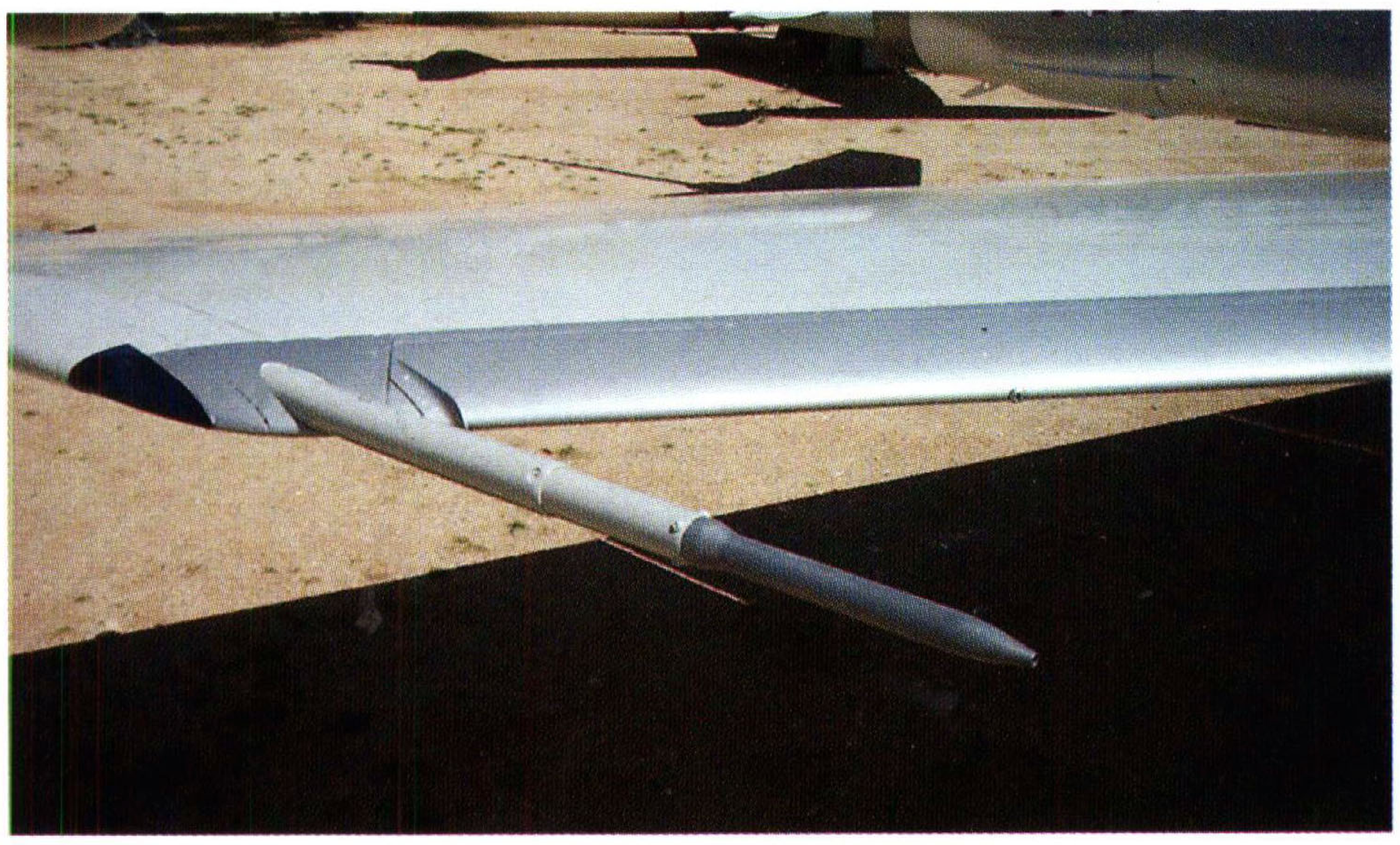
The vertical fin and rudder; the ribbing on the latter is noteworthy

The exhaust outlet with the line of vortex generators forward of it



The all-moving tailplane

The wing fence, in this instance on the port wing



The pitot on the tip of the starboard wing

The inboard pylon under the starboard wing

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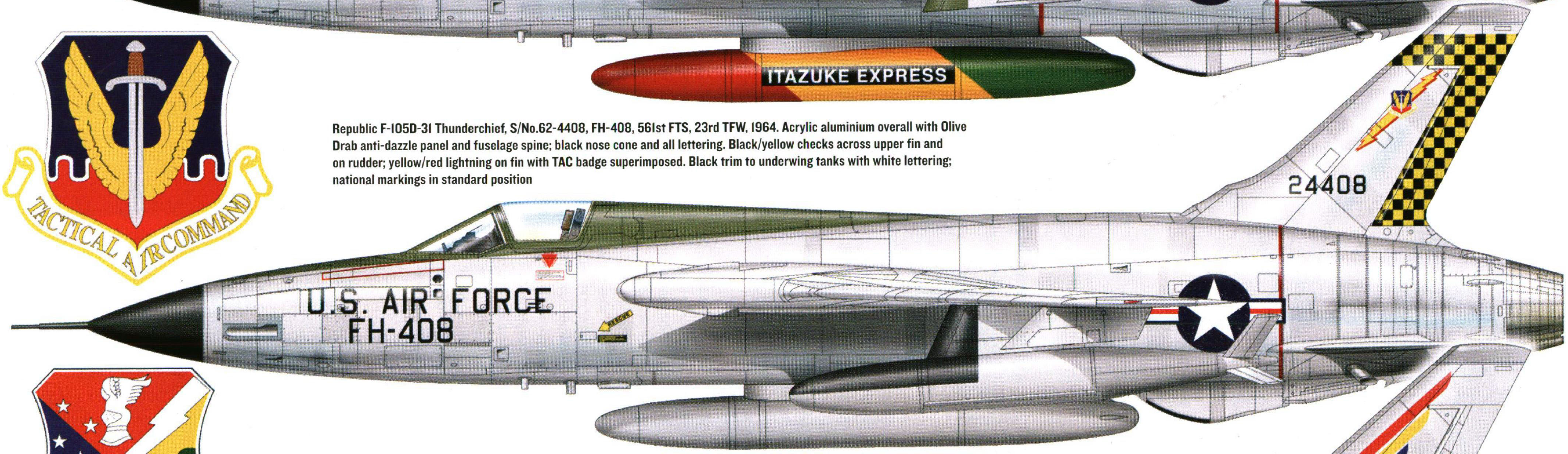
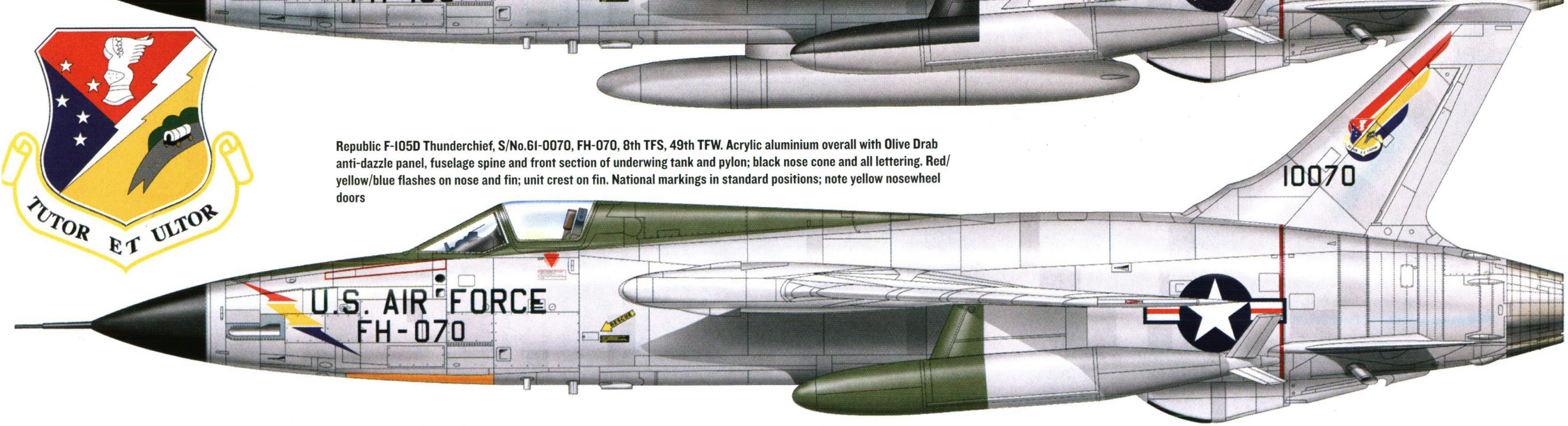
Republic F-105D Thunderchief, S/No.62-4346, FH-346, 8th TFW, Pacific Air Force, Itazuke Air Base, 1963. Acrylic aluminium overall with Olive Drab anti-dazzle panel and spine; black radome and all lettering. Yellow arrow, outlined in black, on air intakes; red/yellow/green ventral fuel tank with black bar and white lettering. Unit crest on fin

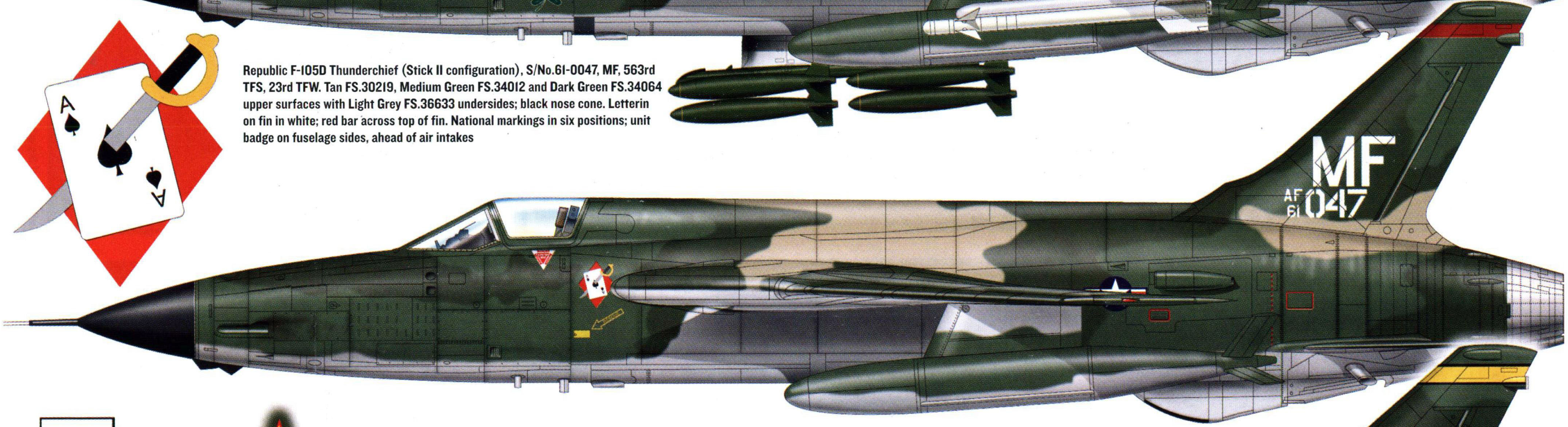
Republic F-105D-31 Thunderchief, S/No.62-4408, FH-408, 561st FTS, 23rd TFW, 1964. Acrylic aluminium overall with Olive Drab anti-dazzle panel and fuselage spine; black nose cone and all lettering. Black/yellow checks across upper fin and on rudder; yellow/red lightning on fin with TAC badge superimposed. Black trim to underwing tanks with white lettering; national markings in standard position



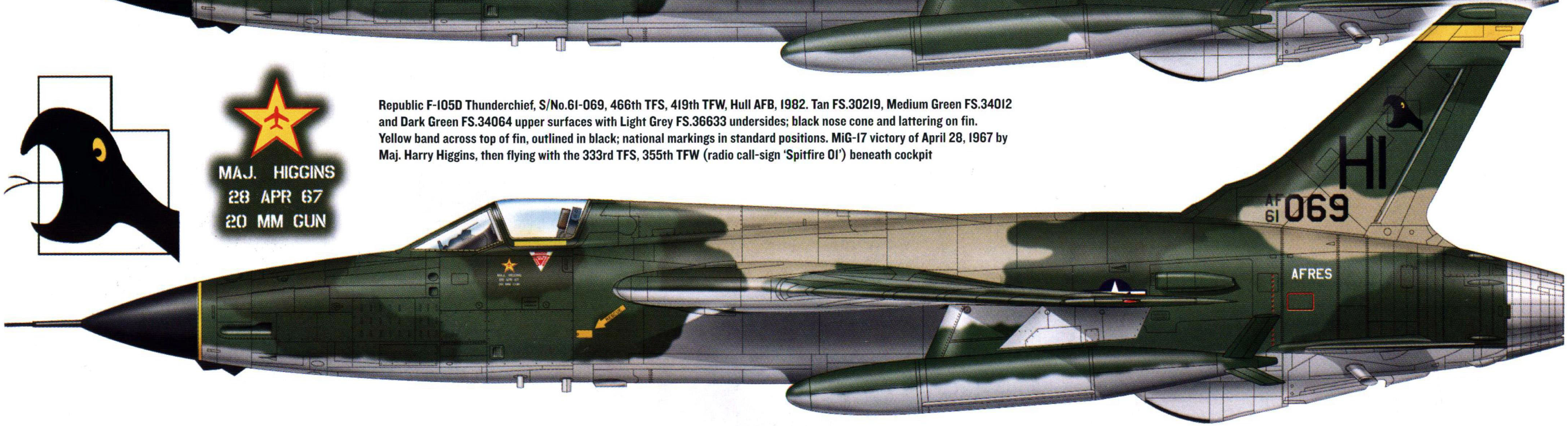
Republic F-105D Thunderchief, S/No.61-0070, FH-070, 8th TFS, 49th TFW. Acrylic aluminium overall with Olive Drab anti-dazzle panel, fuselage spine and front section of underwing tank and pylon; black nose cone and all lettering. Red/ yellow/blue flashes on nose and fin; unit crest on fin. National markings in standard positions; note yellow nosewheel doors



Republic F-105D-25-RE, S/No.61-0196, RU, 'Erie Gal', 357th TFS, flown by Major Art Hood, Takhai, 1968. Tan FS.30219, Medium Green FS.34012 and Dark Green FS.34064 upper surfaces with Light Grey FS.36633 underside; black nose cone. Codes on fin in black and white; national markings in standard positions. Personal marking on lower fuselage side, below cockpit



Republic F-105D Thunderchief (Stick II configuration), S/No.61-0047, MF, 563rd TFS, 23rd TFW. Tan FS.30219, Medium Green FS.34012 and Dark Green FS.34064 upper surfaces with Light Grey FS.36633 undersides; black nose cone. Letterin on fin in white; red bar across top of fin. National markings in six positions; unit badge on fuselage sides, ahead of air intakes



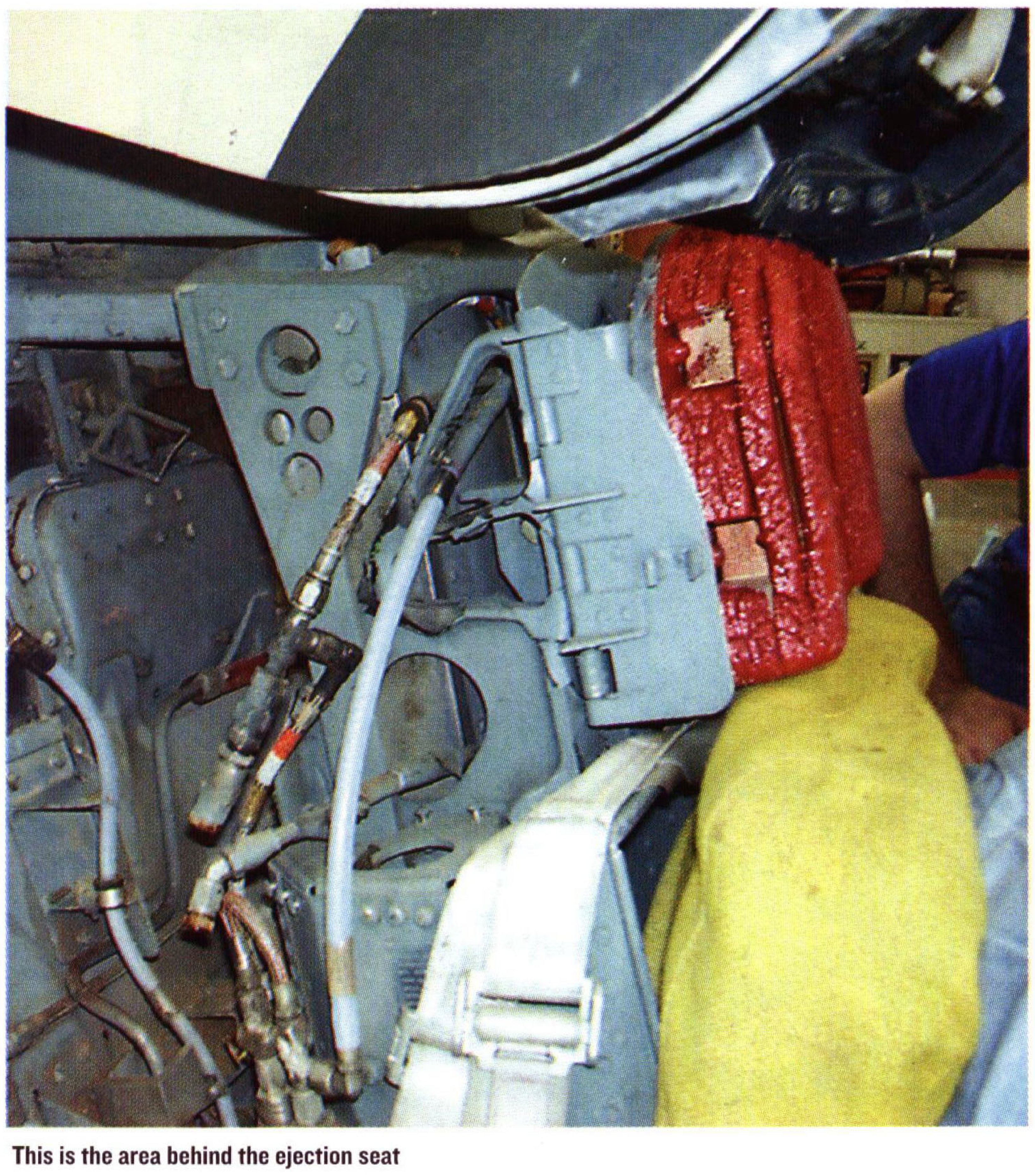
Republic F-105D Thunderchief, S/No.61-069, 466th TFS, 419th TFW, Hull AFB, 1982. Tan FS.30219, Medium Green FS.34012 and Dark Green FS.34064 upper surfaces with Light Grey FS.36633 undersides; black nose cone and lattering on fin. Yellow band across top of fin, outlined in black; national markings in standard positions. MiG-17 victory of April 28, 1967 by Maj. Harry Higgins, then flying with the 333rd TFS, 355th TFW (radio call-sign 'Spitfire 01') beneath cockpit

1:1 REFERENCES

The following images depict the F-105D at the Pima Air & Space Museum in the USA.

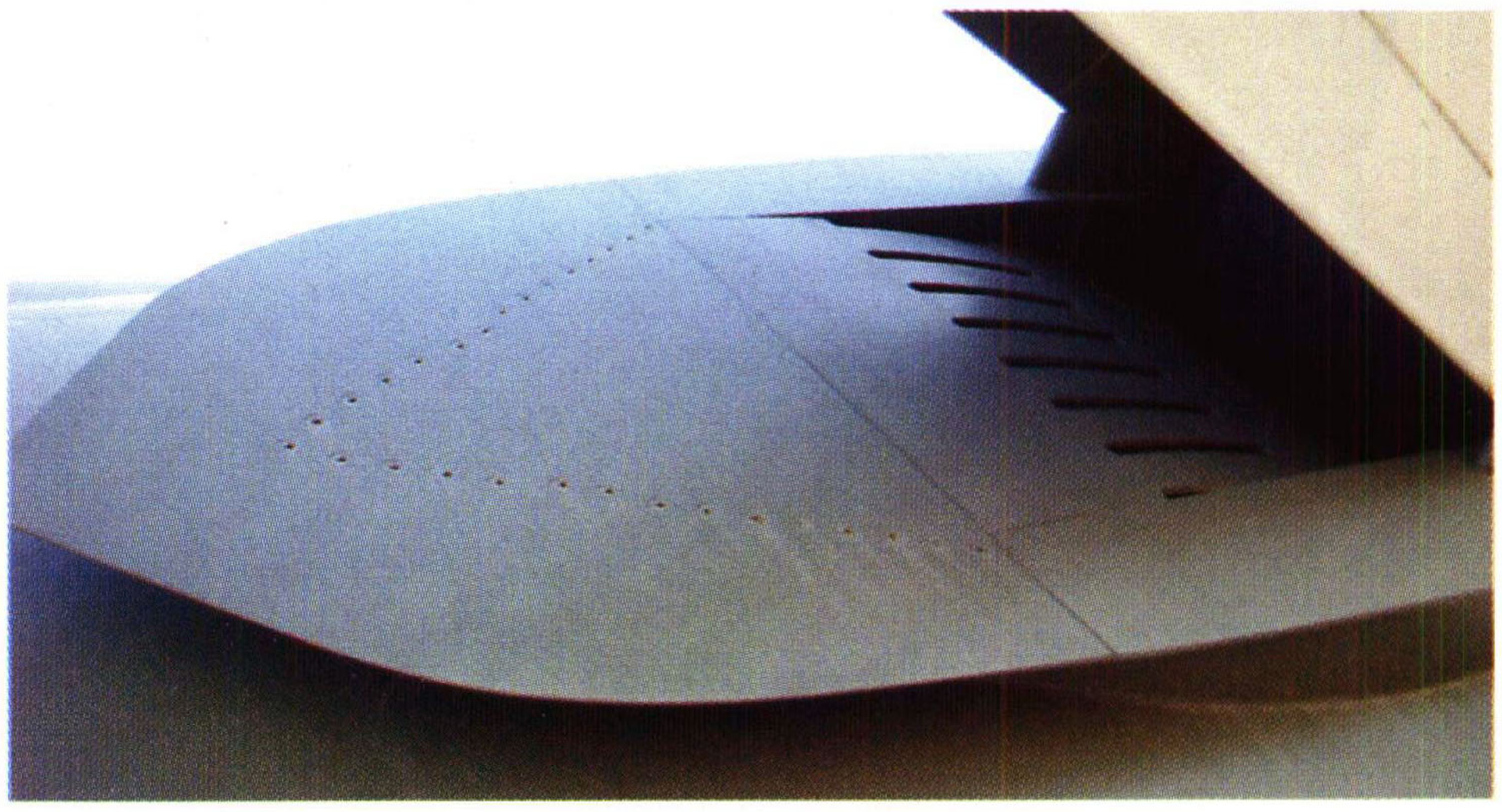
All photos © George Papadimitriou

The shot of the cockpit interior shows the instrument panel and port sidewall

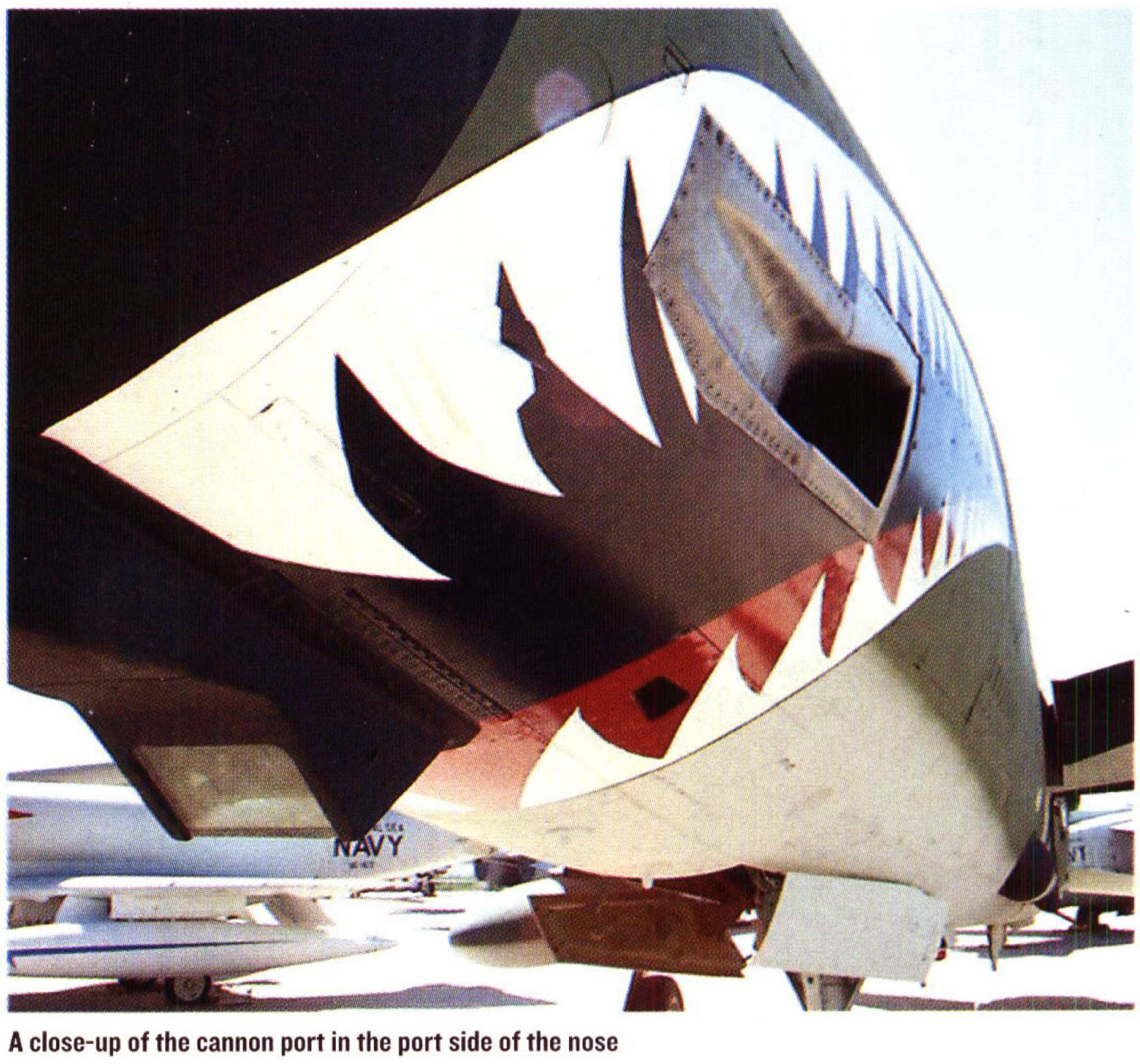


This is the area behind the ejection seat

This shot shows the starboard sidewall and the control column



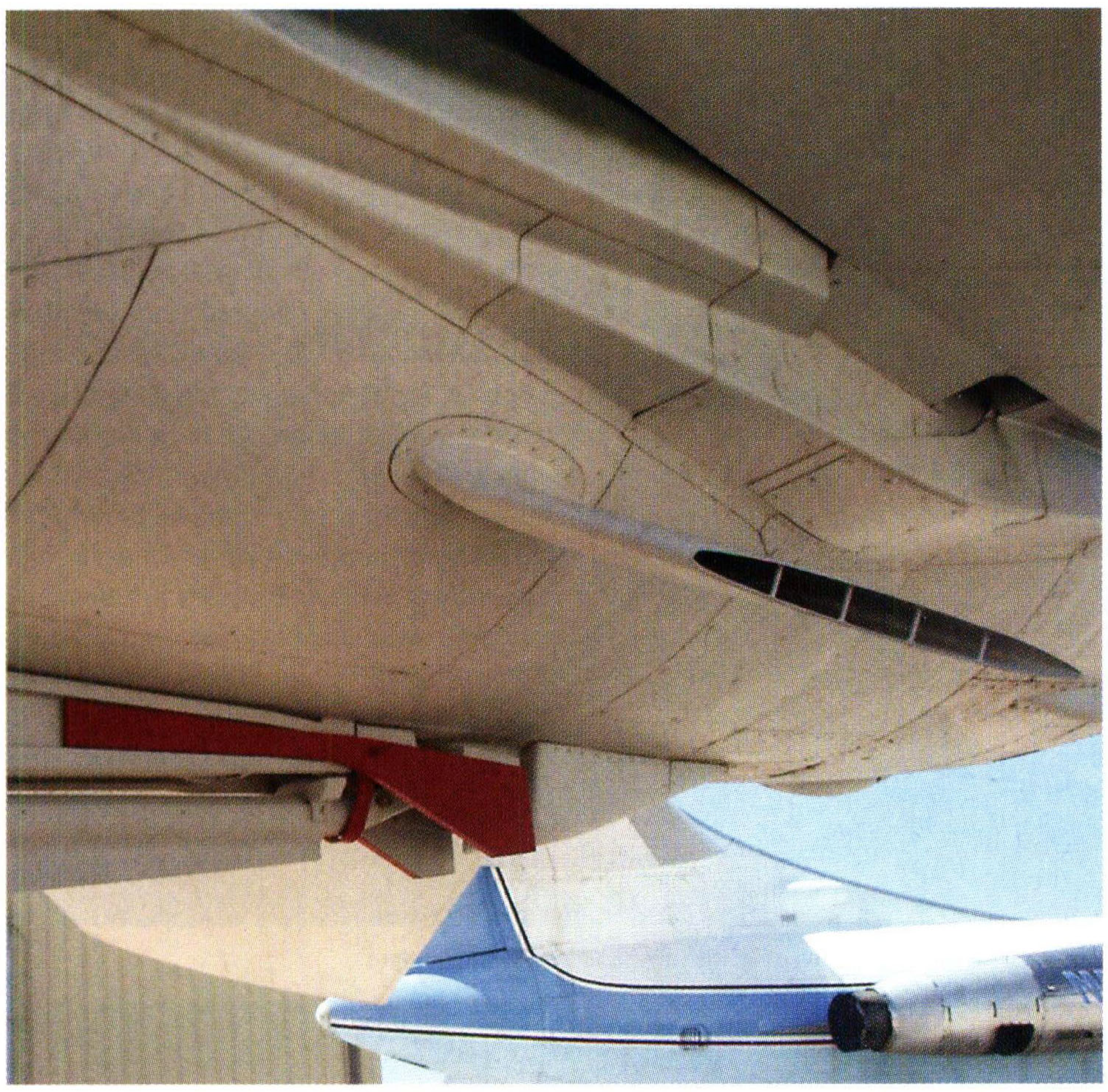
This unusual angle shot looks up into the intake and shows the splitter plate with the bleed vents in it



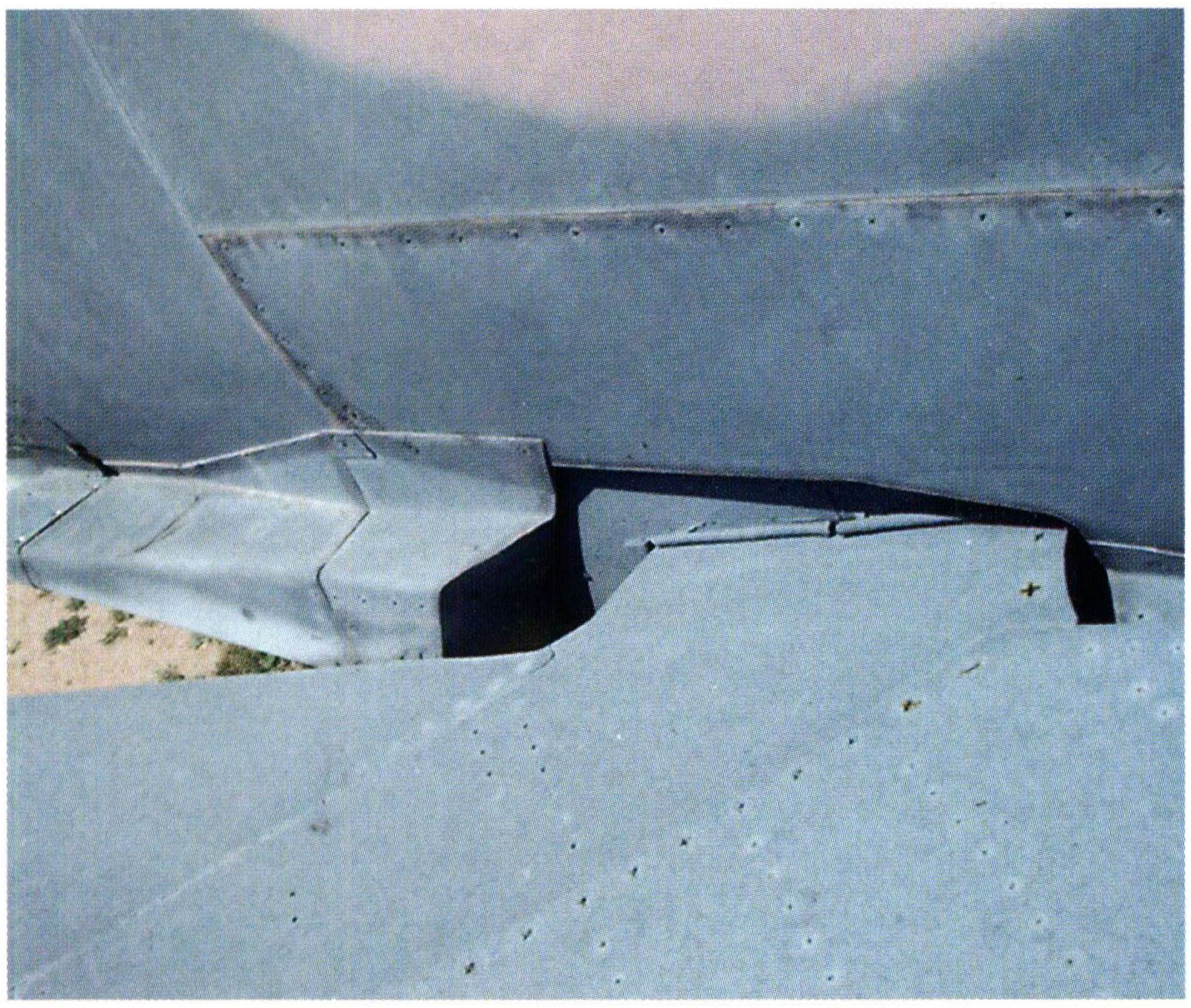
A close-up of the cannon port in the port side of the nose

This view on the mid-fuselage underside shows the blade aerial, formation light and anti-collision beacon and the wiring tunnel on the port side

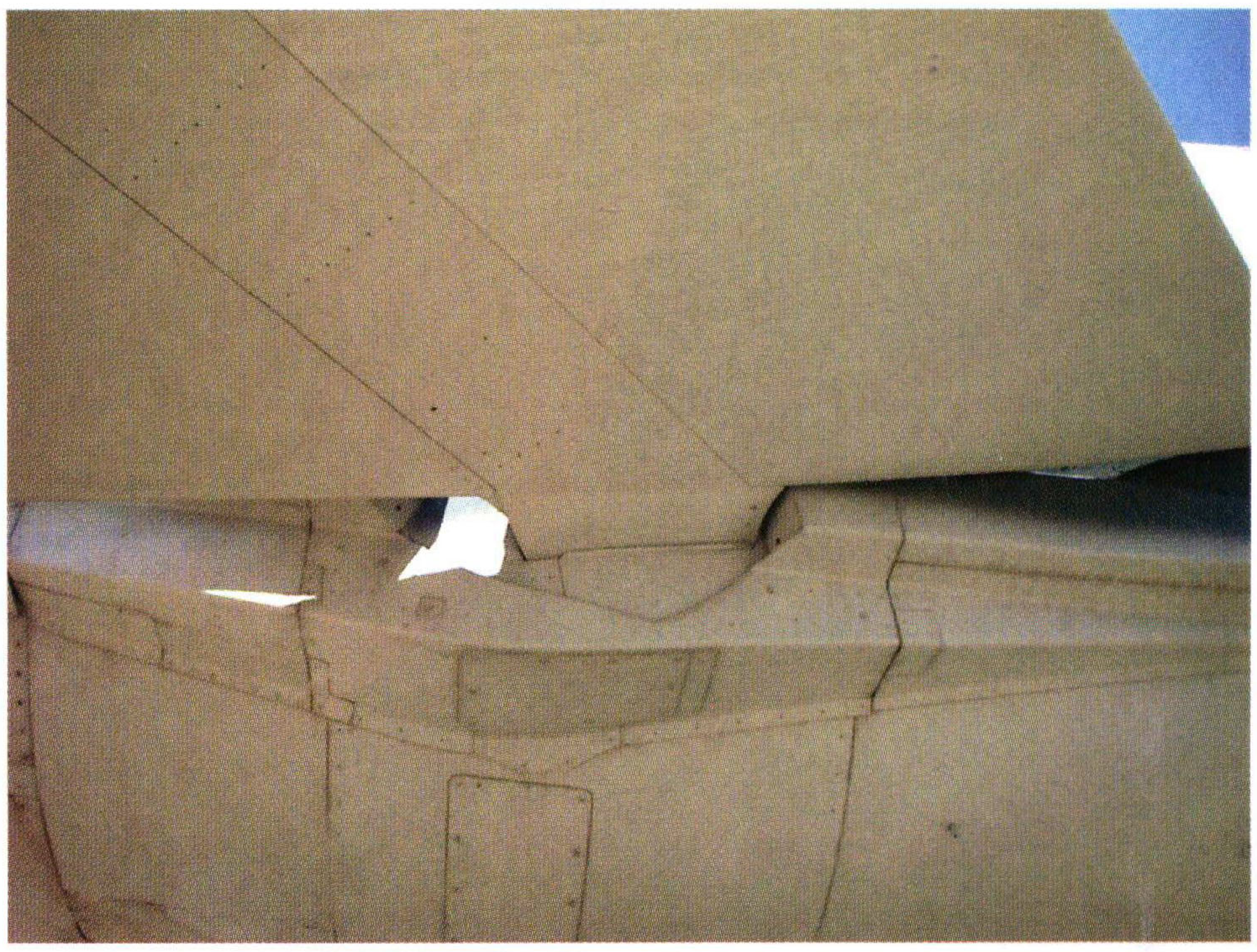
Further back down the fuselage, looking forward, you will find these outlets



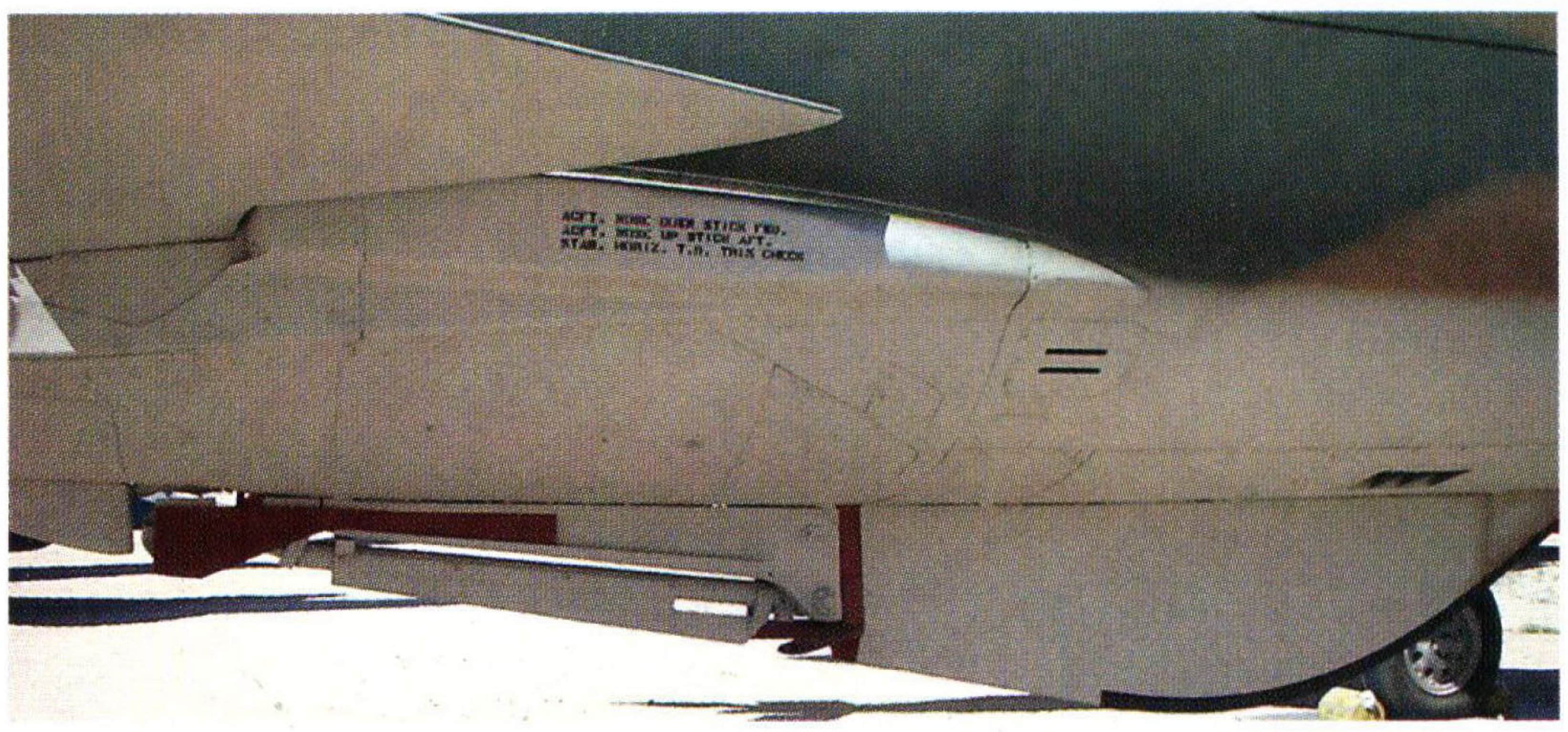
These are the two prominent fuel dumps under the aft rear fuselage



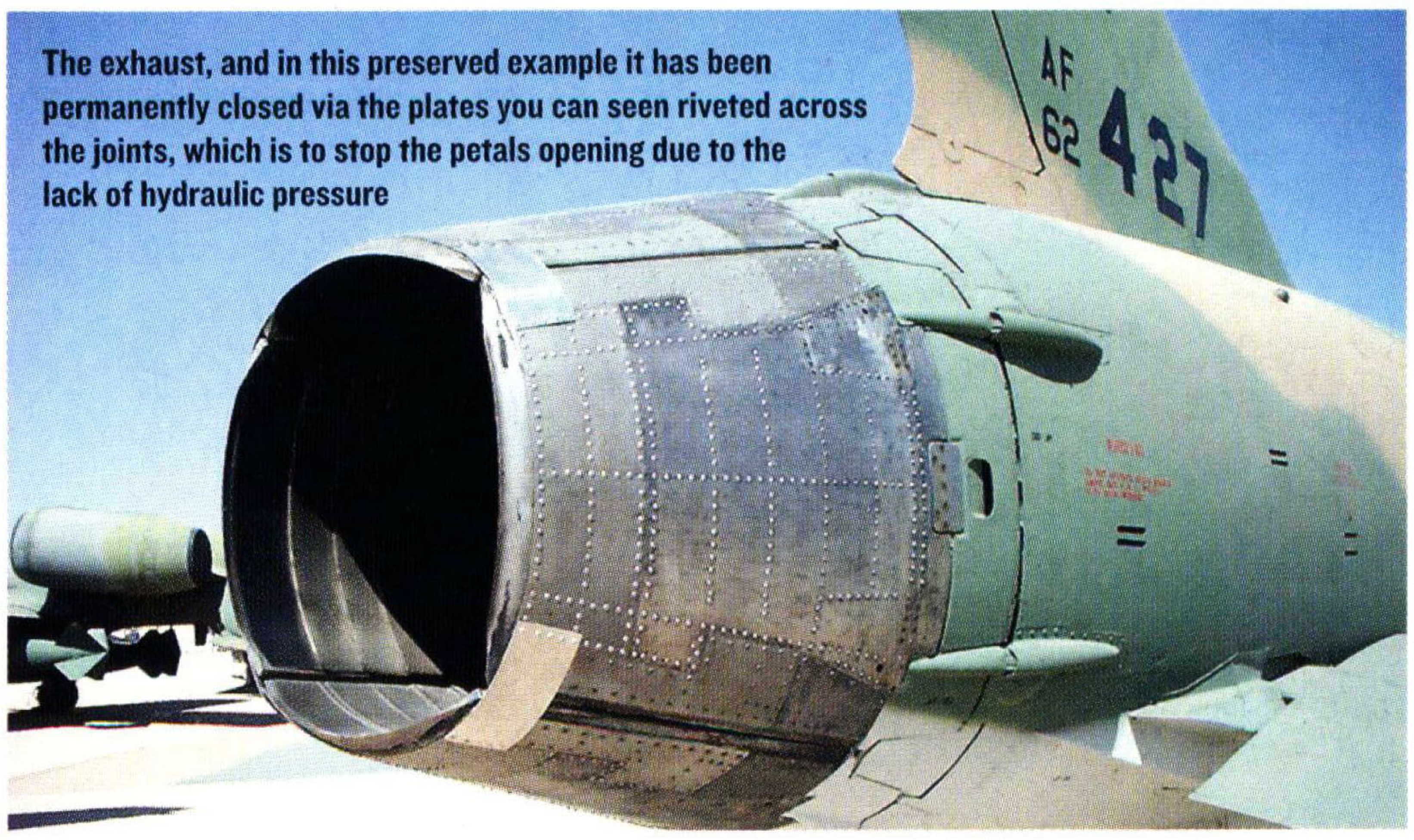
This shot shows the tailplane joint viewed from above



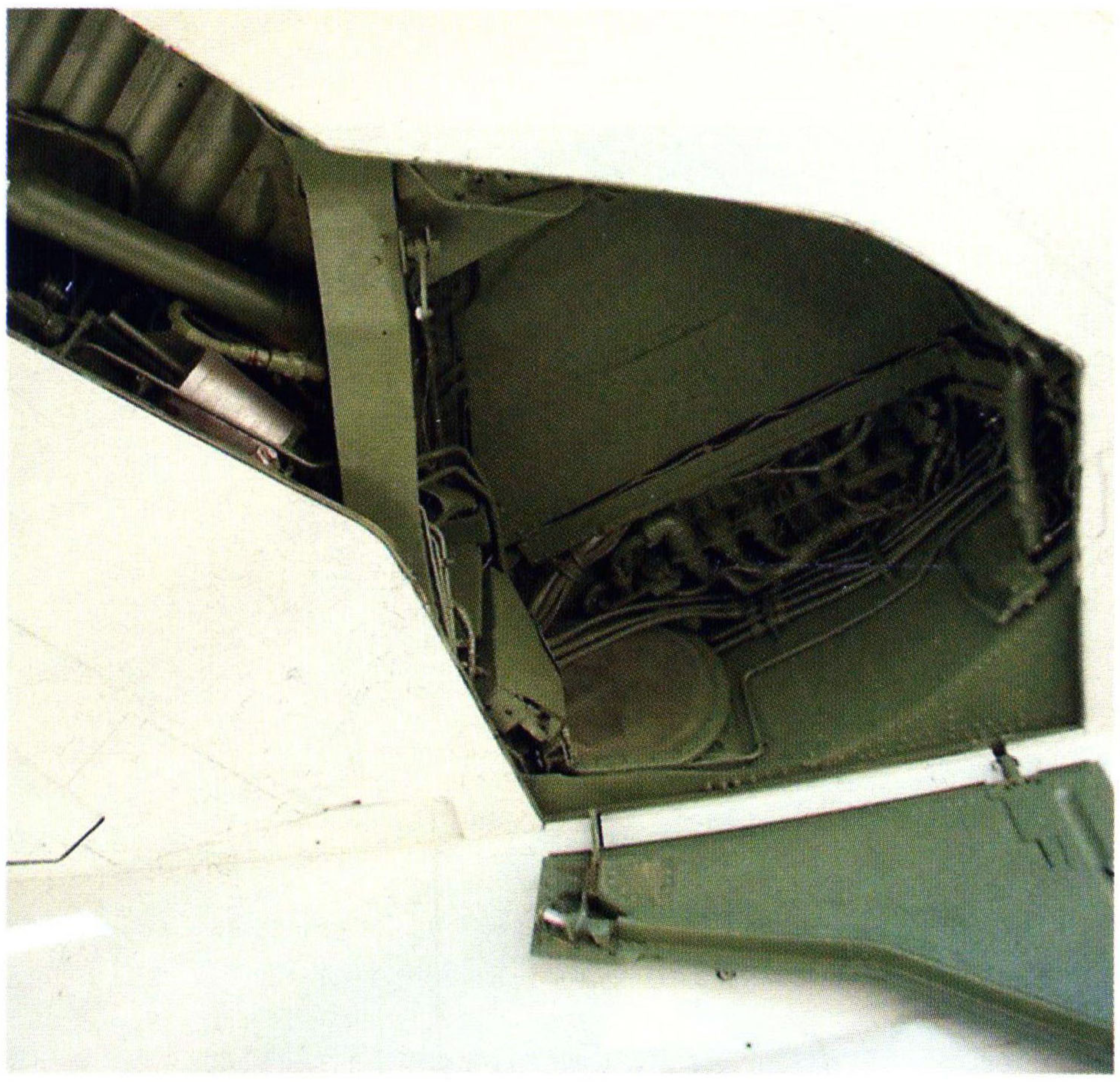
This is the swivel joint for the tailplane, viewed from underneath



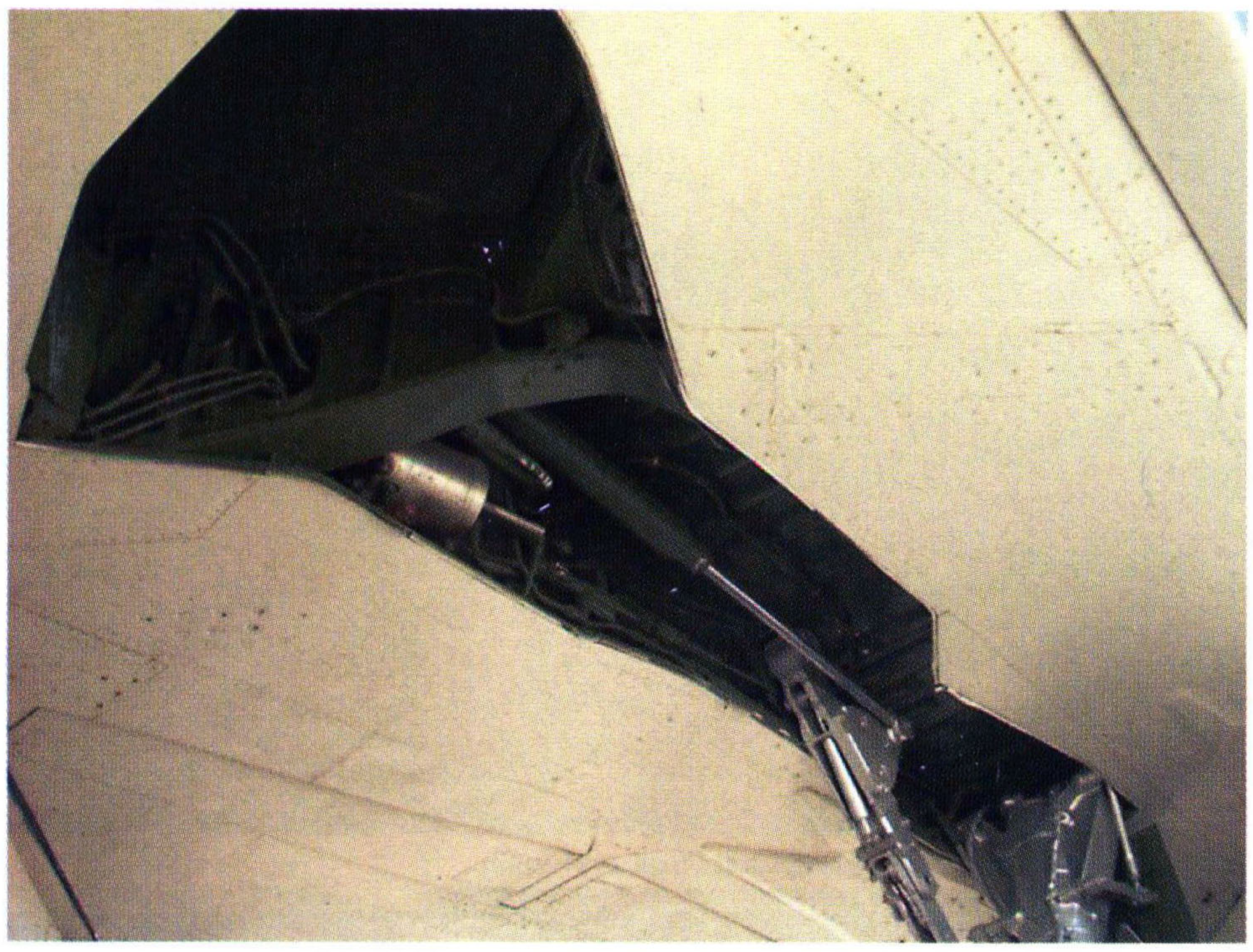
Here you can see the large ventral fin and the airfield emergency arrestor hook behind it



The exhaust, and in this preserved example it has been permanently closed via the plates you can seen riveted across the joints, which is to stop the petals opening due to the lack of hydraulic pressure



A look into the mainwheel well, this view looking inwards towards the fuselage



This shot of the mainwheel well is taken looking outwards towards the wingtip

The inner face of the main oleo leg, with all the various hydraulic pipes

A look at the rather complex linkage at the back of the nose oleo leg. The oleo is fully deflated due to the lack of hydraulic pressure in this preserved example

The TER (Triple Ejector Rack) on the centerline position carrying cluster bombs

if disturbed. Once the decals had settled and dried overnight another coat of clear sealed them in in preparation for the weathering process.

My normal method of weathering used is that of a grey oil wash over the model but this time I tried, with mixed success, a new product on the market from Pro Modeller, namely their grey wash. This clay-like wash is simply brushed onto the model and left to dry out, which took only twenty minutes, then when dry a slightly damp kitchen towel is used to remove the excess from the model, following the direction of the airflow. This worked okay in the deeper recesses but I found oil paint to be better for the shallow detail as you have slightly more control with this method. The model is then left another few hours to dry. I chose to deviate from the Gunze-Sangyo products as I have found that Andrea Miniatures Matt Varnish AC-044 is the best and this was duly airbrushed over the model. The engine exhaust had caused me some head scratching and I chose to replicate this with Alclad II metal paints. The first one was Jet Exhaust followed by several light shadow shades of Gunze-Sangyo H91 Clear Yellow, H93 Clear Blue and H96 Smoke Blue, until I was satisfied. Final weathering was achieved with the use of Tamiya X-19 Smoke thinned with alcohol, which requires very light subtle shading with the airbrush where the panels are stressed to make it look like stressed skin. This was one of the longest parts of the build but the results are worth it, especially near the back end of the model. The entire undercarriage was also given the Alclad II treatment. The gun bay was masked off and airbrushed with the appropriate colours; the gun was hand painted with various shades of Gunze-Sangyo metallic namely H8 Silver, H18 Steel and H28 Metal Black.

FINALS

All the rest of the parts for the model were attached at this stage and where appropriate superglued into position. I added the lights with Formula 560 white glue as this dries clear and gives a good strong bond. The pitot head, weapons and canopy were also added and once complete she was ready to go off for photography. ■

Also Available

As John has mentioned this kit would benefit from the attentions of the aftermarket, especially in the cockpit. Well, never fear as Eduard has produced the following detail sets for this kit.

72-477 - Exterior Detail Set Price Guide: £13.50
73-300 - Interior Detail Set [self-adhesive] Price Guide: £11.75
SS300 - Interior Detail Set 'Zoom' [self-adhesive] Price Guide: £3.70
CX201 - Canopy & Wheel Painting Masks Price Guide: £2.50

FINAL VERDICT

■ I must admit to having a soft spot for the century series and I am glad to see Trumpeter doing the honours with a new kit of this important beast. The curves of the area-rule fuselage look good to me and what really matters is that she looks like the F-105D. I would like to see a return by the manufacturer to the cockpits like that in their 1:72 Vigilante instead of the simplified one we have here. Attention to detail by the design section at Trumpeter will, I am sure, get better in time. I just wish they would stop making silly errors with things like markings and Multiple Ejector Racks instead of Triple Ejector Racks as other areas of the kit were superb, which is a little annoying. Some of the engineering is over the top but the end product is one I can recommend to almost any level of modeller. Start-to-finish I managed to complete this in just four days which is testament to the ease of construction. By the time you read this I am sure there will be plenty of brass etc. to fill the cockpit and more accurate decal choices too. I am certainly looking forward to the imminent release of the F-105G.

Was it worth the money?
Every single penny, and more!

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XK72001 .... £11.99
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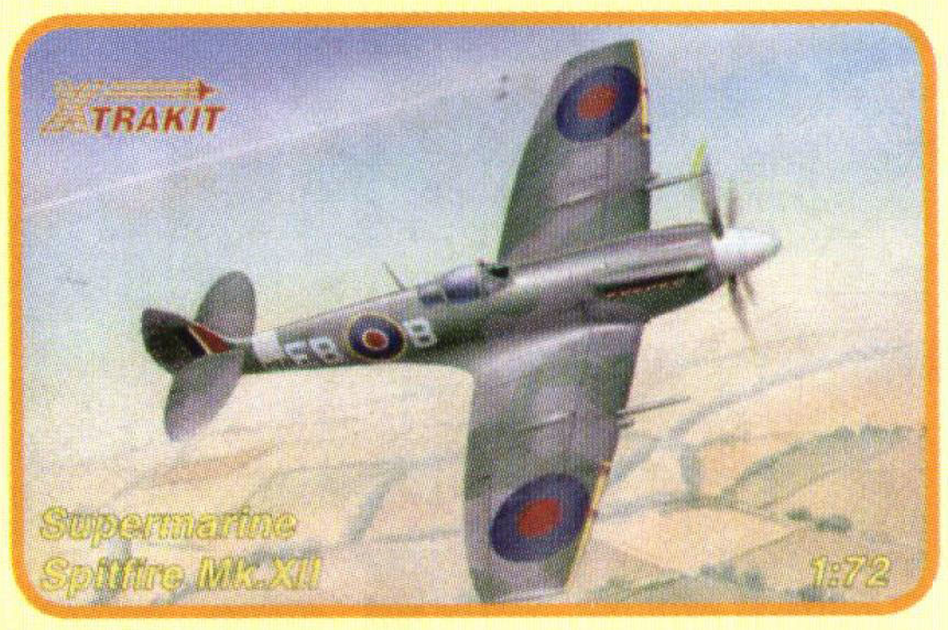

XK72006 .... £9.99
Supermarine Spitfire Mk.XII (new tooling)

XK72004 .... £16.99
EE Canberra PR 9 (new tooling)

XK72002 .... £6.95
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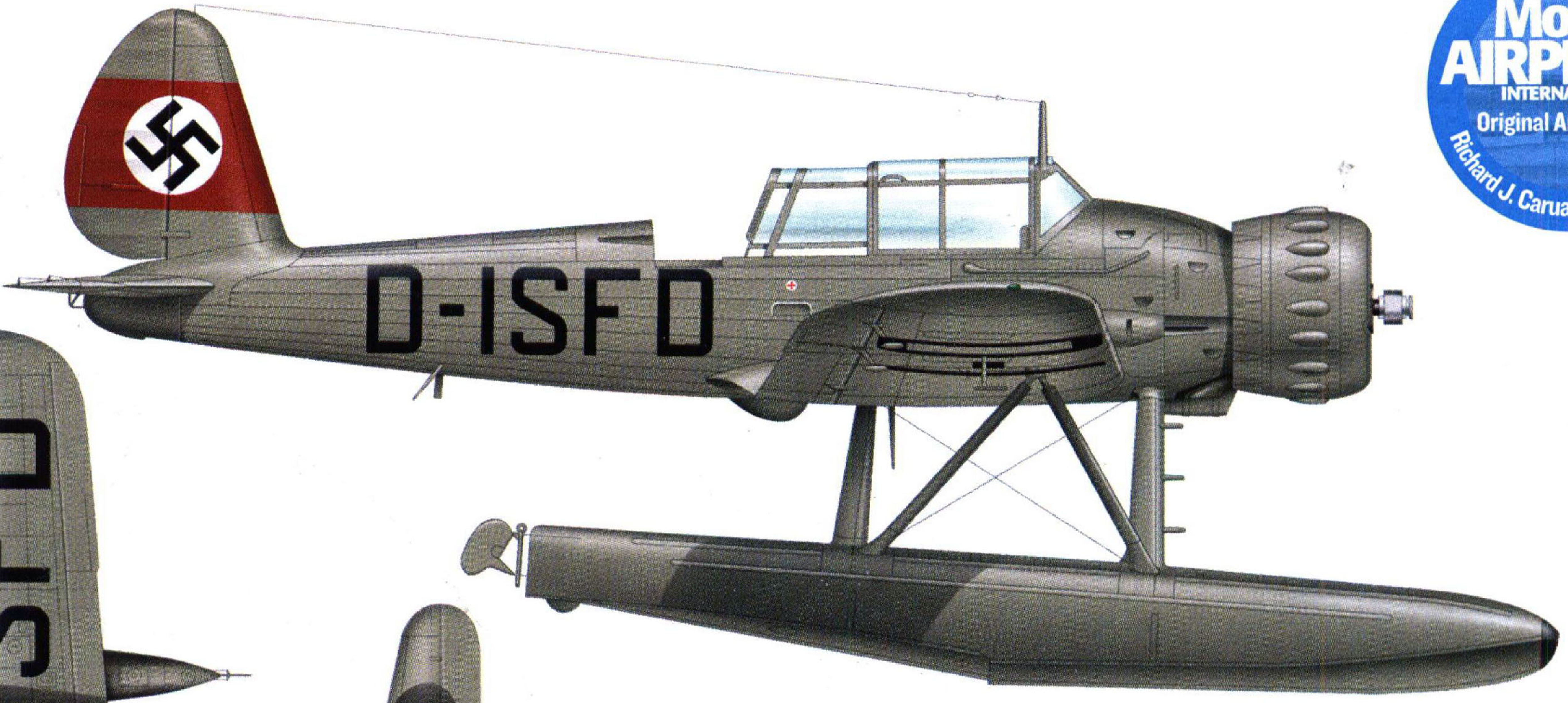
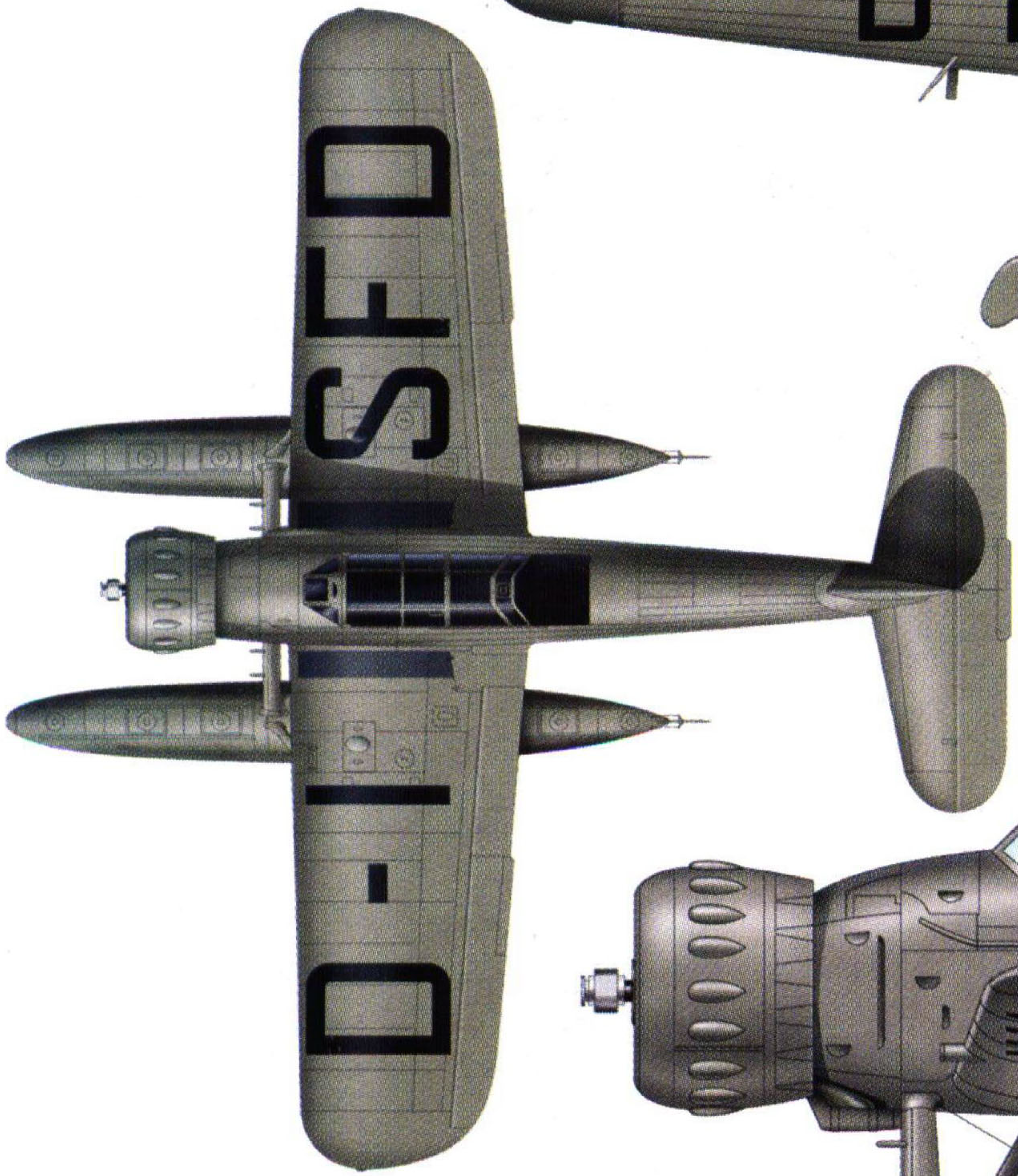
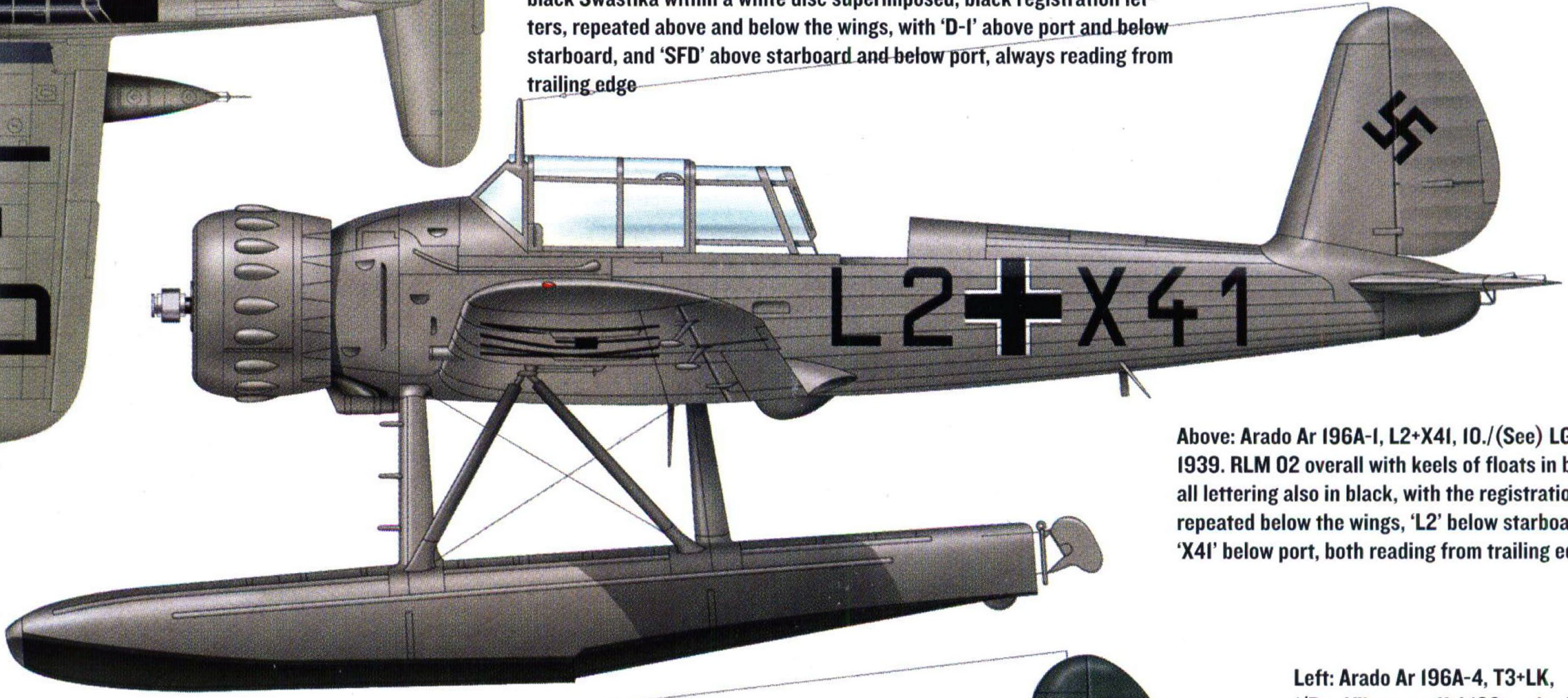
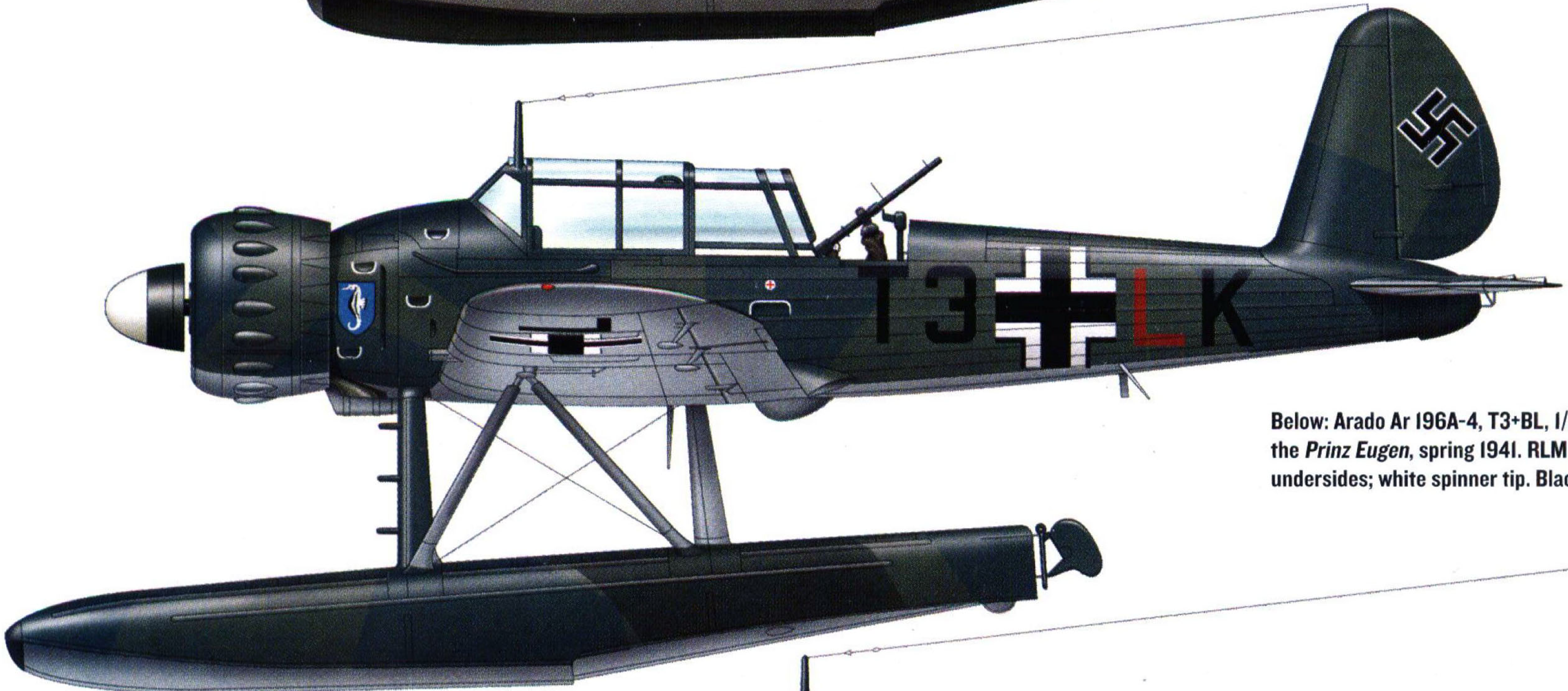




Above & Left: Arado Ar 196A-1, D-ISFD, 10./(See) LG 2, 1939. RLM 02 Grau overall with RLM 23 Rot band across vertical tail surfaces with black Swastika within a white disc superimposed; black registration letters, repeated above and below the wings, with 'D-I' above port and below starboard, and 'SFD' above starboard and below port, always reading from trailing edge

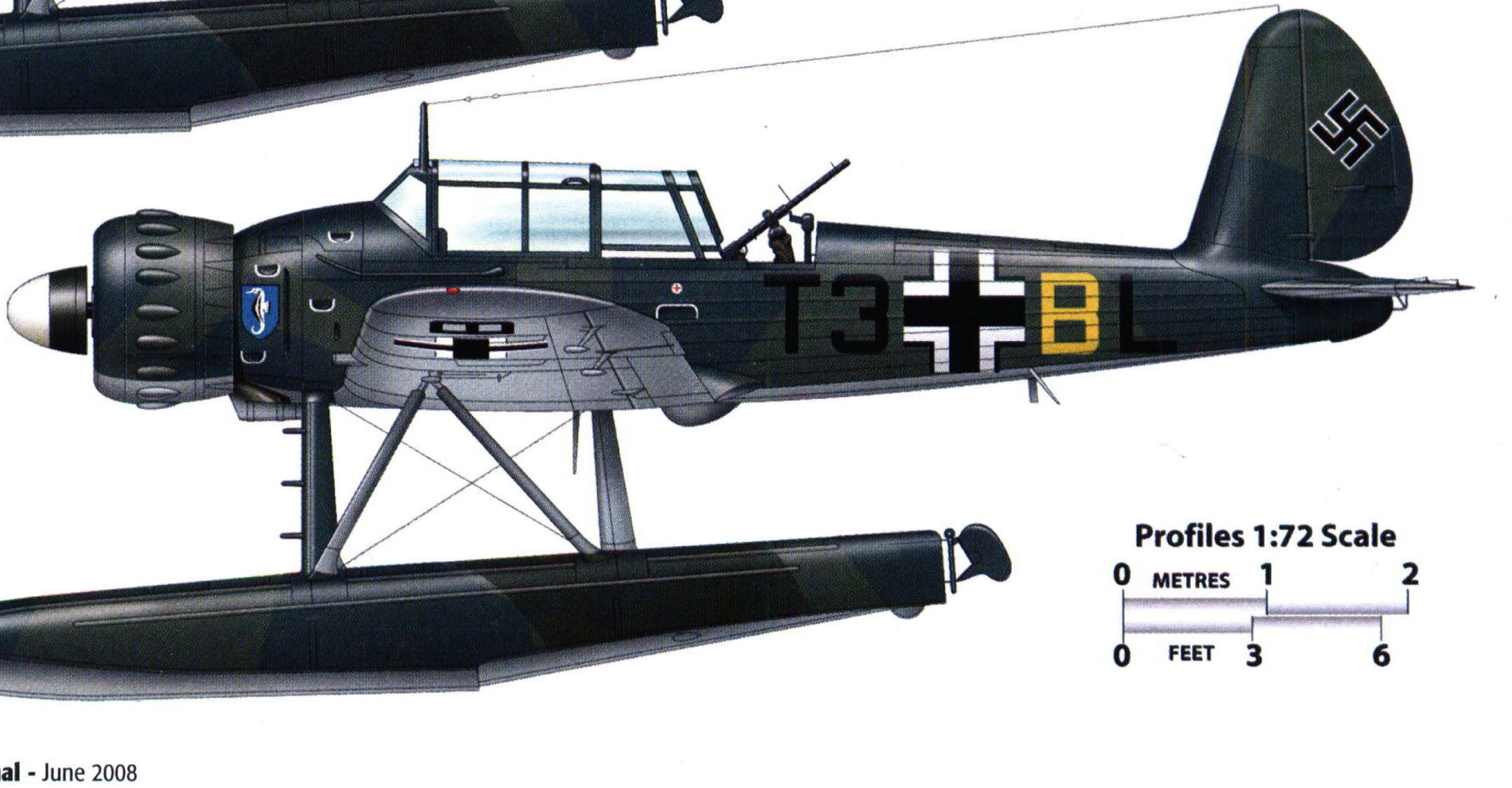


Above: Arado Ar 196A-1, L2+X41, 10./(See) LG 2, Kiel, 1939. RLM 02 overall with keels of floats in black; all lettering also in black, with the registration repeated below the wings, 'L2' below starboard, and 'X41' below port, both reading from trailing edge



Left: Arado Ar 196A-4, T3+LK, I/Bordfliegerstaffel 196, embarked on the *Bismark*, 1941. RLM 72/73 upper surfaces with RLM 65 undersides; white spinner tip. Black/red codes; unit badge on nose

Below: Arado Ar 196A-4, T3+BL, I/Bordfliegerstaffel 196, embarked on the *Prinz Eugen*, spring 1941. RLM 72/73 upper surfaces with RLM 65 undersides; white spinner tip. Black/yellow codes; unit badge on nose



Profiles 1:72 Scale

0 METRES 1 2
0 FEET 3 6

A pair of Arado Ar 196A-3s from 2./SAGr 128 flying out from their base in Brest during summer of 1943 (R.J. Caruana Archives)

WATERBORNE WATCHER

Designed to meet a *Reichsluftfahrtministerium* requirement for a shipboard reconnaissance aircraft, the Arado Ar 196 was loved by those who flew it and remained in service with the *Kriegsmarine* until 1944. It saw service in Bulgaria, Finland, Norway and Romania and even managed to capture HMS Seal.

The Arado Ar 196 was destined to be the last of a long line of successful floatplanes designed and produced by the German aircraft industry during the Second World War. Its debut was an important event, in that it was utilised in 1939 as the long-range eye of the Graf Spee when the pocket battleship was preying Allied commercial routes.

In 1936 the German Technische Amt prepared a specification for a two-seat aircraft with alternative single- and twin-float arrangements. Its performance was to be achieved through a total of 800-900hp and preference would be given to a single-engined configuration. Heinkel, until then the undisputed leaders in this field, failed to place a bid due mainly to problems it was having with the He 144 sesquiplane. Arado, Dornier, Focke-Wulf and the Gothaer Waggonfabrik all made submissions but the Arado project was favoured from the outset and four prototypes were immediately ordered under the designation of Ar 196. The Arado Ar 196 V1 (D-IEHK) and V2 (D-IHQI) had the twin-float arrangement.

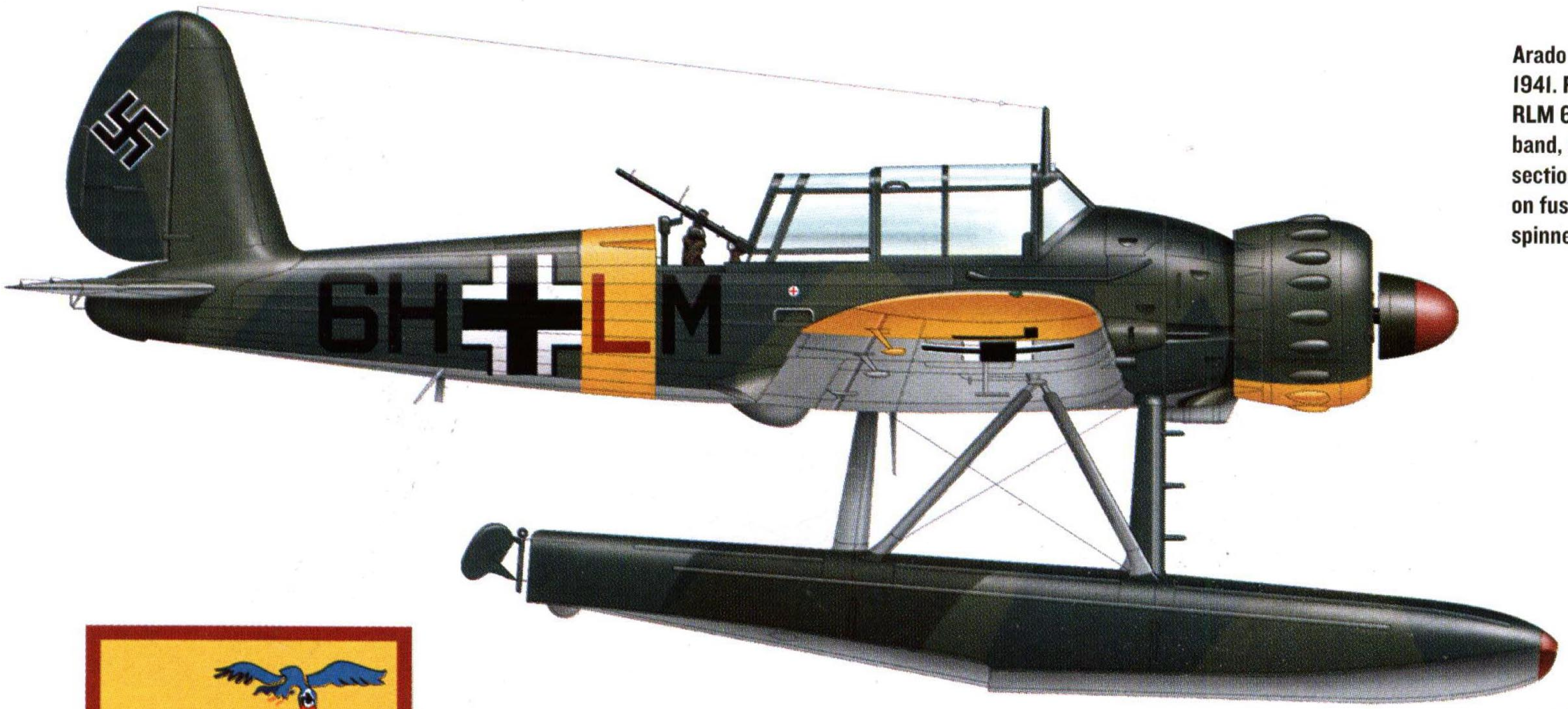
There were members of the Technische Amt who thought that the design was too advanced for the time while others continued to favour the biplane configuration, with the result that a contract was simultaneously awarded to the Focke-Wulf company for two prototypes of their conventional design, the Fw 62. These prototypes, the Fw 62 V1 (D-OFWF) and V2 (D-OHGF) had twin-float and single-float arrangements respectively.

Trials for both aircraft took place at Travemünde in the summer of 1937 with each company's pair of prototypes. All aircraft were powered by the BMW 132Dc nine-cylinder air-cooled radial, which provided 880hp for take-off driving a two-pitch Schwarz propeller. The superiority of the Ar 196 was so marked from the outset that the Focke-Wulf contender was immediately eliminated from the contest.

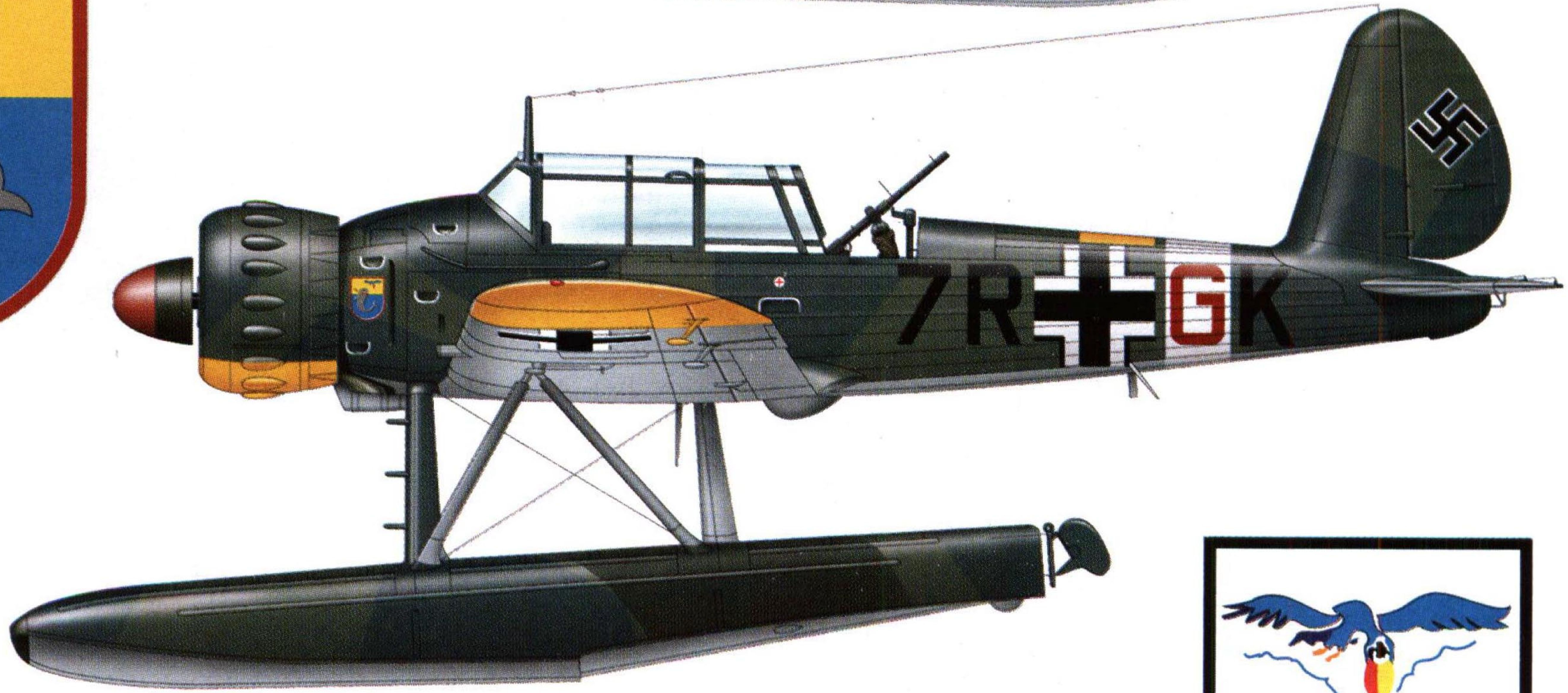
With the contest over the next two prototypes soon joined their predecessors and consisted of the Ar 196 V3 (D-ILRE) and V4 (D-OVMB). These were known as the B-series, as they featured a single central float with two outrigger stabilising floats. There was little difference in performance between the two models and the Ar 196 was the first floatplane ever to mount armament in the form of two wing-mounted 20mm MG FF cannon with 60 rounds per gun and a 7.9mm MG 17 machine gun with 500 rounds fitted to the starboard side of the fuselage, firing forward through the propeller arc. It could also be fitted with two underwing containers each intended to house a single 50kg SC50 bomb.

Tests were carried out to evaluate the alternative float arrangements during August 1937 but these did not result in a definitive choice between the different configurations. However it was decided to order 10 pre-series Ar 196A-0 twin-float aircraft and at the same time construct a third B-series prototype, the Ar 196 V5, fitted with ➤

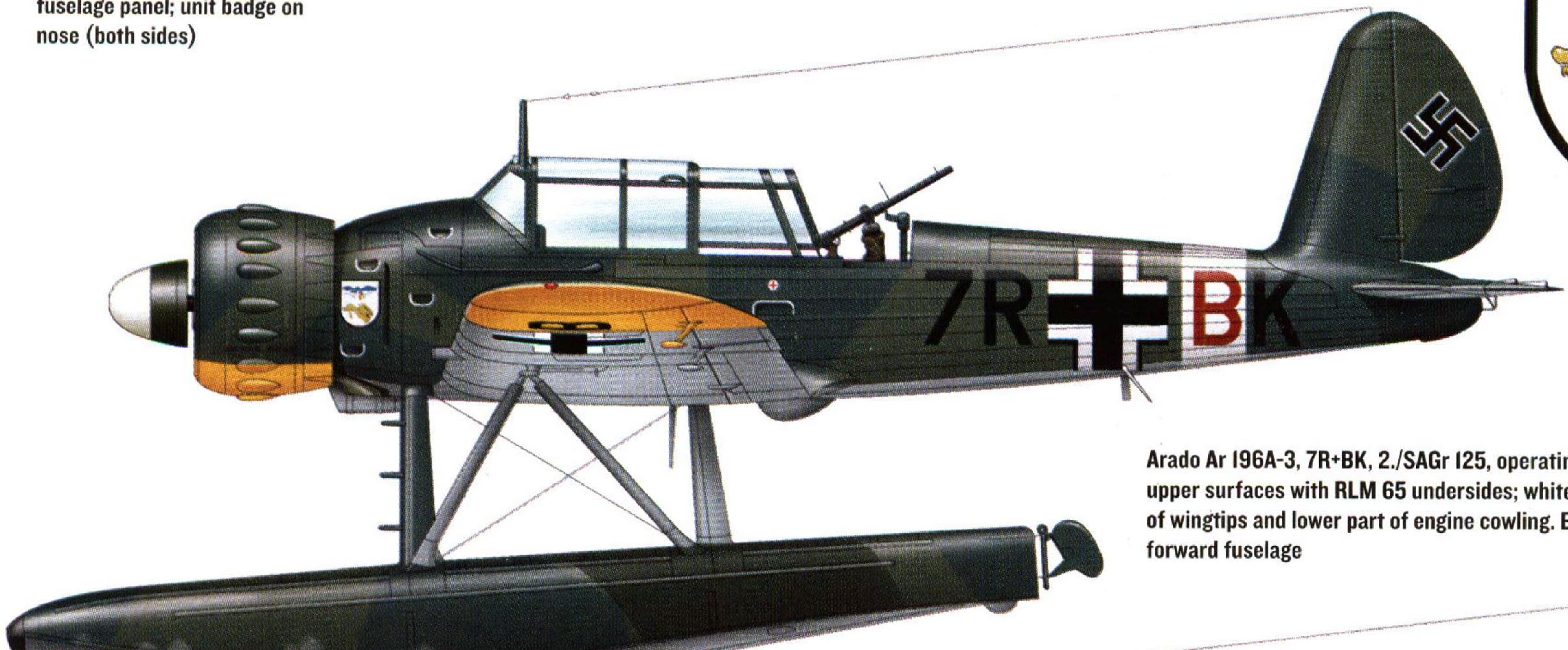
Operating in the Mediterranean, this Arado Ar 196A is clearly identified as belonging to 2./SAGr 125 from the badge carried on the nose (R.J. Caruana Archives)



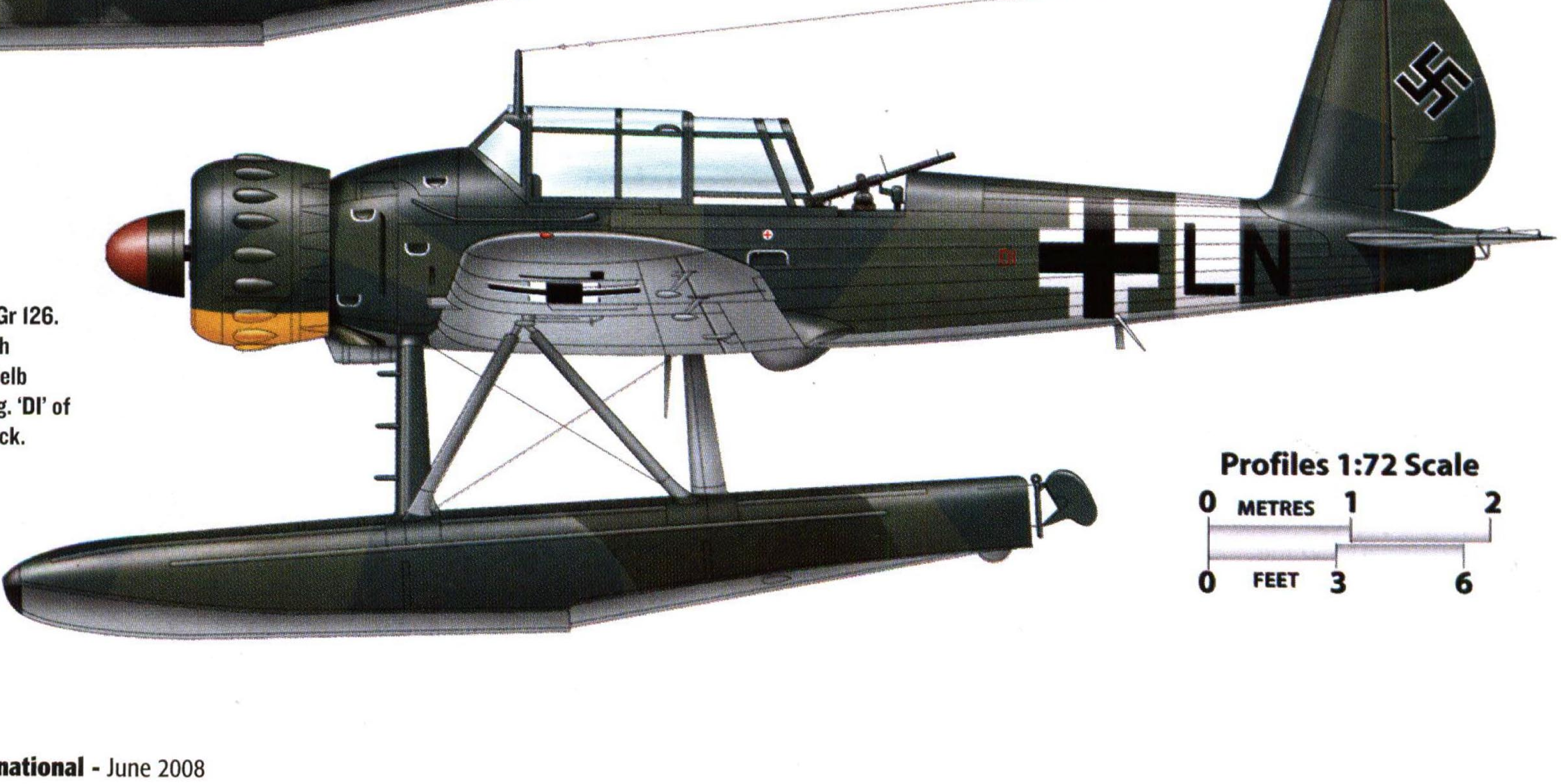
Arado Ar 196A-3, 6H+LM, Flg.Erg.Gr. (See), 1941. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 04 Gelb fuselage band, underside of wingtips and lower section of engine cowling. Black/red codes on fuselage sides; Rot 23 front tips of spinner and floats



Arado Ar 196A-3, 7R+GK, 2./SAGr 125, Crete, 1941. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 23 Rot front tip of spinner and floats. Codes in black and red; white rear fuselage band. RLM 04 Gelb underside of wingtips, lower section of engine cowling and dorsal fuselage panel; unit badge on nose (both sides)



Arado Ar 196A-3, 7R+BK, 2./SAGr 125, operating in the Aegean, 1942. RLM 72/73 upper surfaces with RLM 65 undersides; white fuselage band, yellow underside of wingtips and lower part of engine cowling. Black/red codes; unit badge on forward fuselage



Arado Ar 196A-3, DI+LN, 5./SAGr 126. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 04 Gelb lower section of engine cowling. 'DI' of code in RLM 23 Rot, 'LN' in black. RLM 23 front tip of spinner

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

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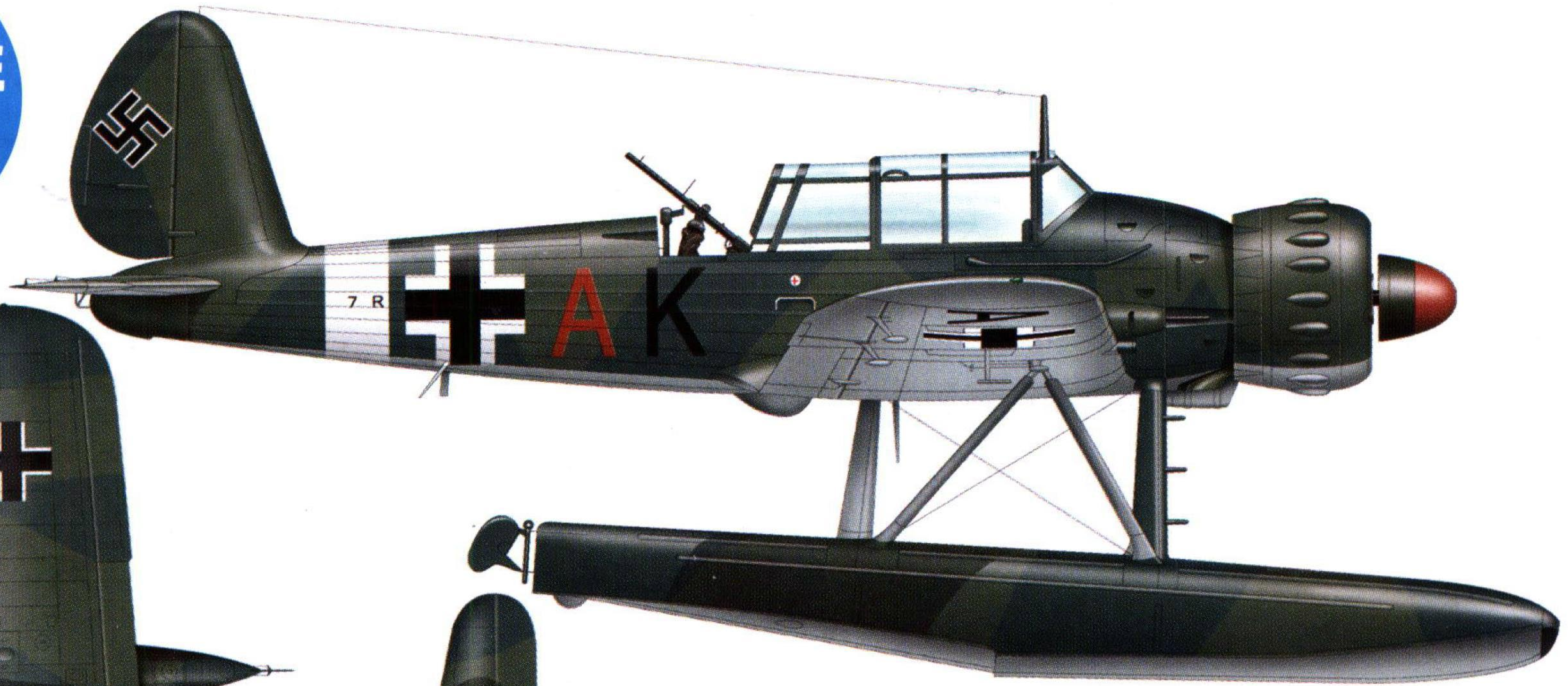
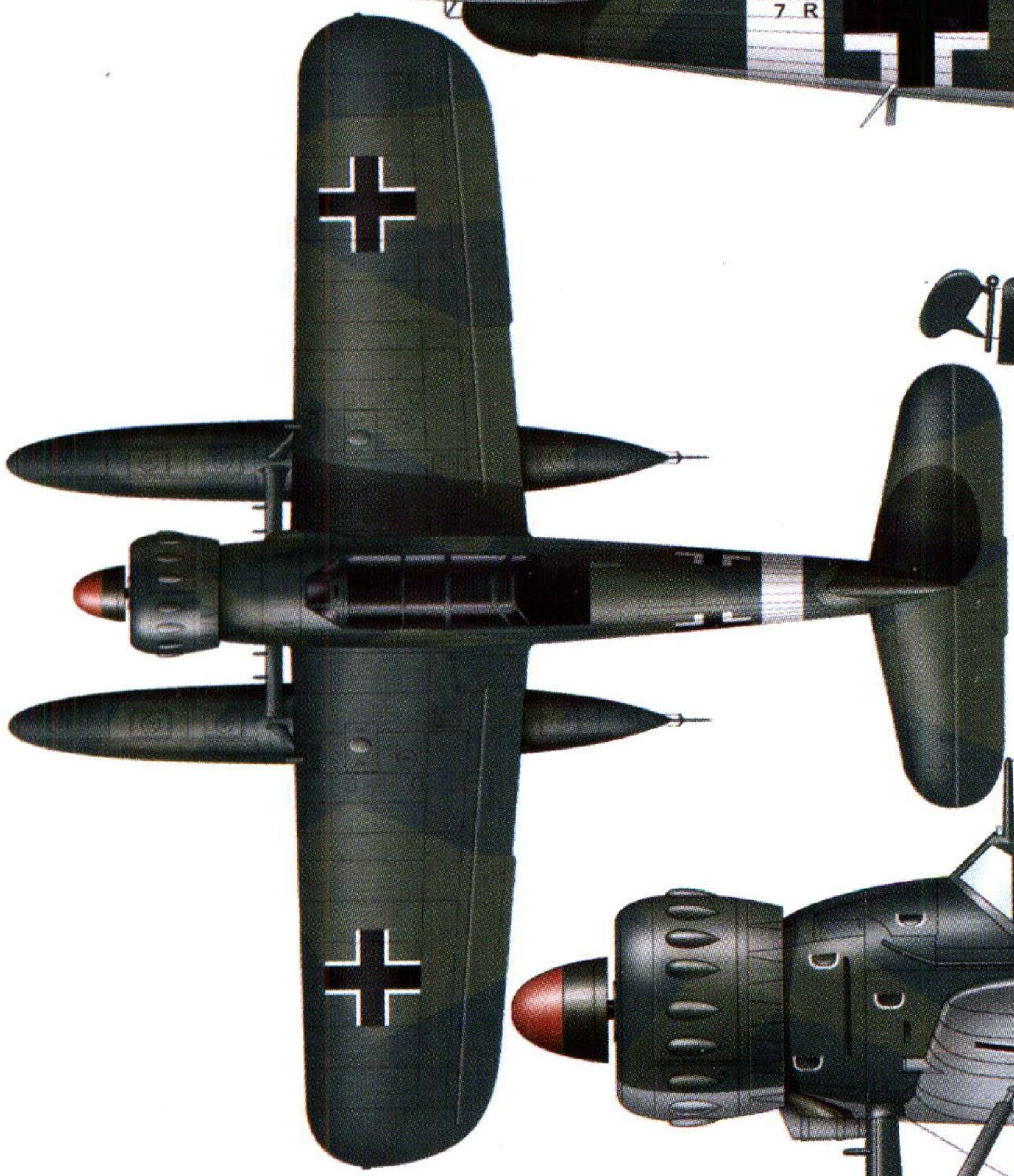
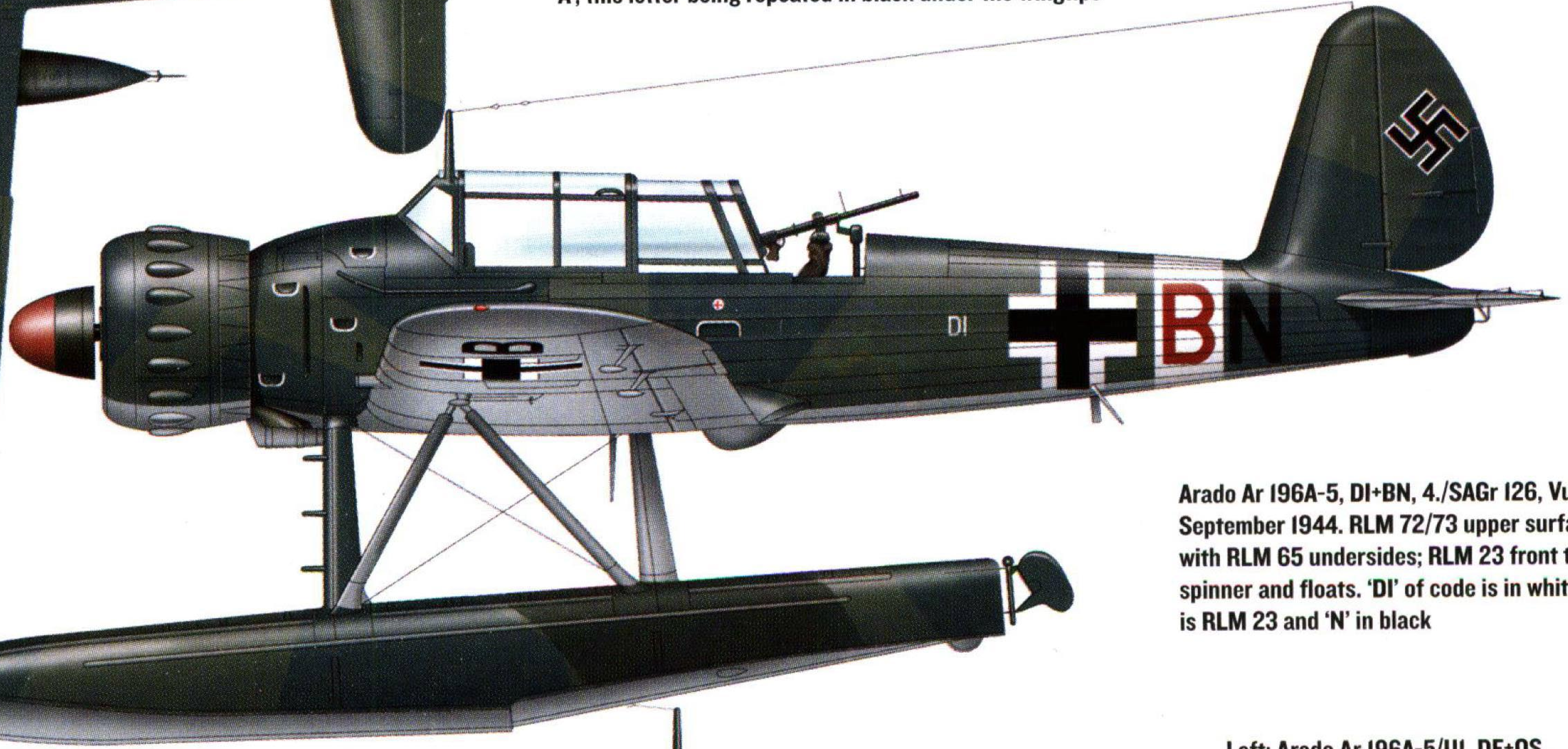
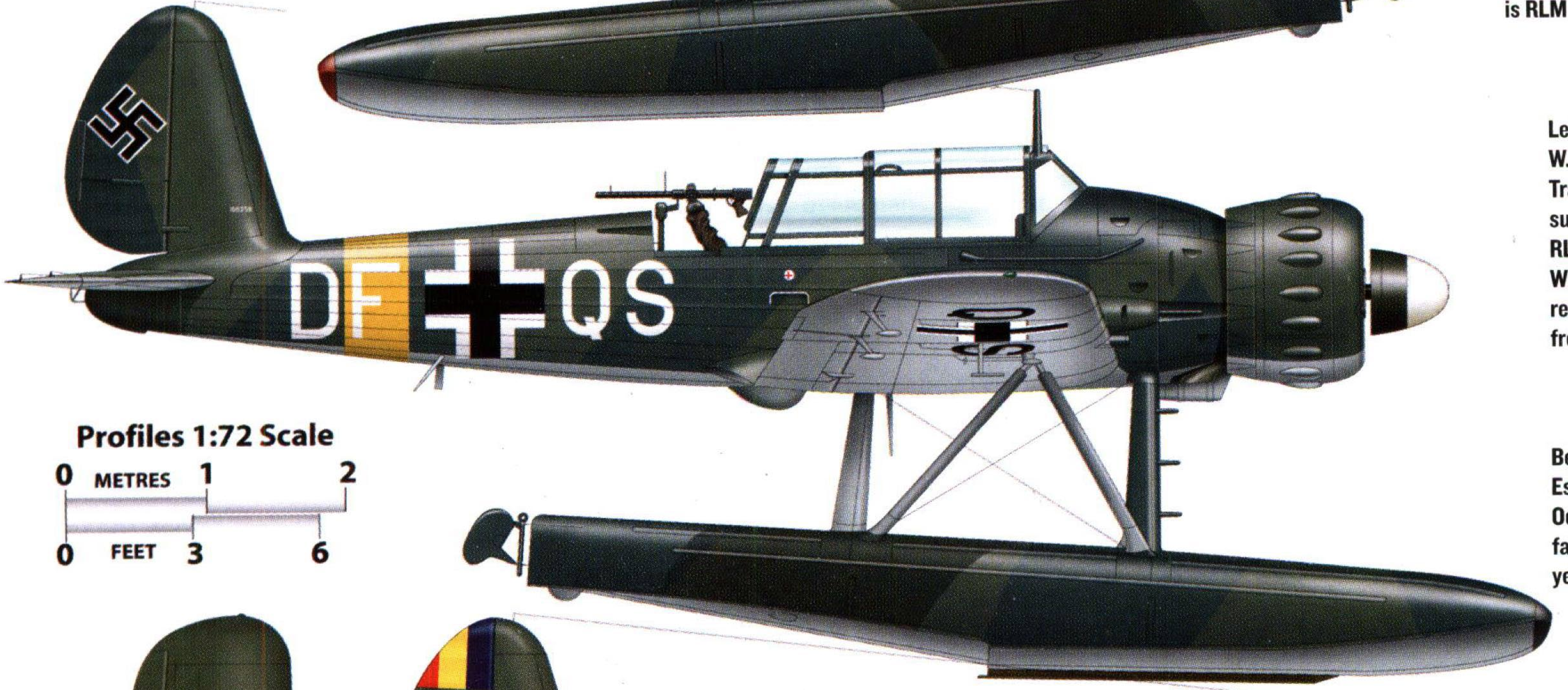




Above & Left: Arado Ar 196A-3, 7R+AK, of 2./SAGr125, operating from a base in the Dodecanese, 1943. RLM 72/73/65 scheme with RLM 70 propeller spinner rear section, RLM 23 Rot front spinner section. Black code with RLM 23 'A', this letter being repeated in black under the wingtips



Arado Ar 196A-5, DI+BN, 4./SAGr 126, Vukovar, September 1944. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 23 front tips of spinner and floats. 'DI' of code is in white, 'B' is RLM 23 and 'N' in black



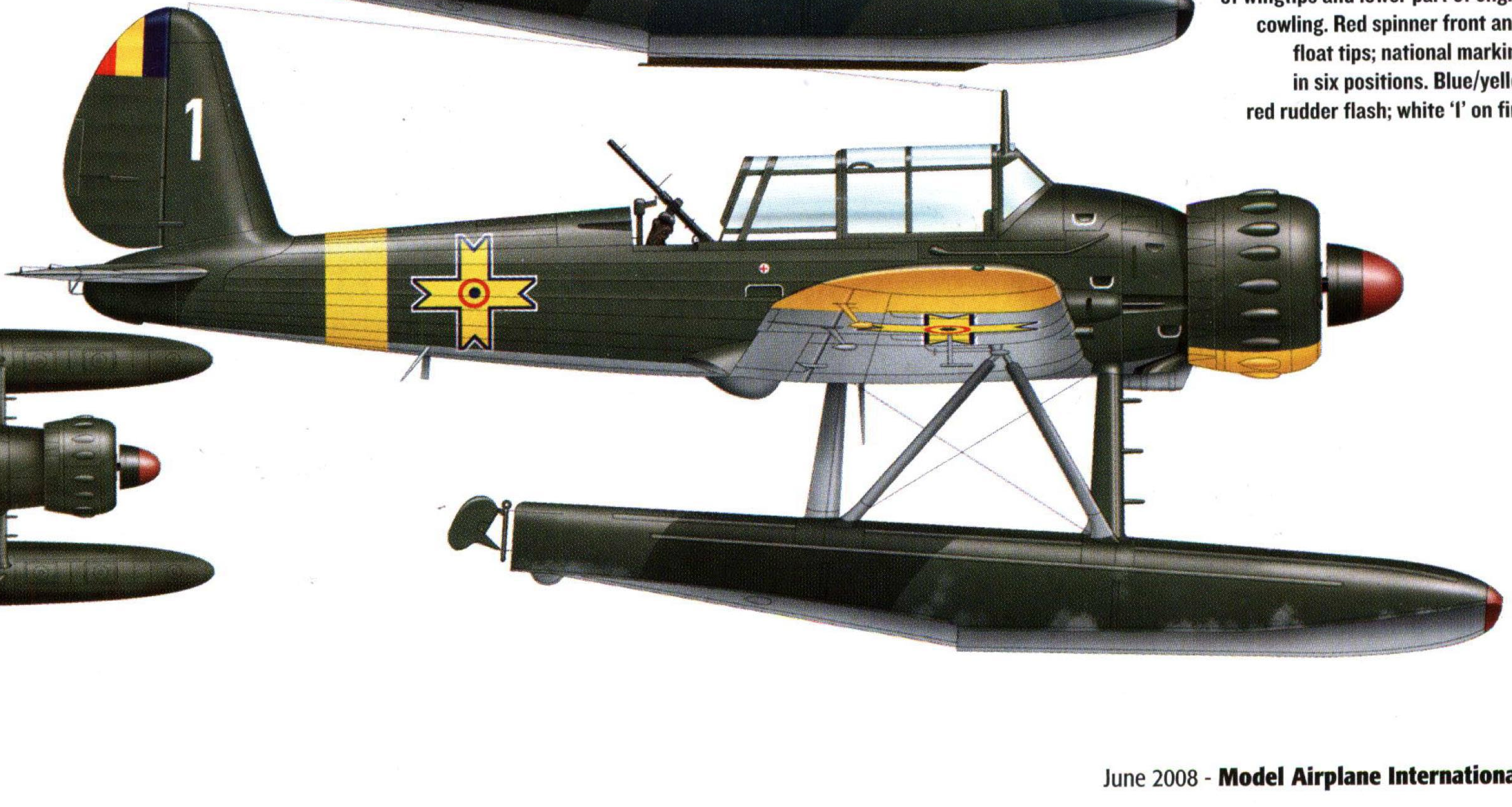
Left: Arado Ar 196A-5/U1, DF+QS, W.Nr. 100359, Erprobungsstelle w Travemünde, 1944. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 04 Gelb band around rear fuselage. White codes on fuselage, with 'QS' repeated in black below the wings; white front tip of spinner

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

Below: Arado Ar-196A-3, 'White 1', Escadrila 102, Rumanian Air Force, Odessa, 1943. Dark green upper surfaces with light blue-grey undersides; yellow rear fuselage band, underside of wingtips and lower part of engine cowling. Red spinner front and float tips; national markings in six positions. Blue/yellow/red rudder flash; white '1' on fin



7R+GK is another Arado Ar 196A-3 from 2./SAGr 125 but carries a different badge on the nose and is one of the subjects of the colour profiles (R.J. Caruana Archives)

the uprated BMW 132K engine driving a three-bladed variable-pitch propeller intended for production models.

THE AR 196 DESCRIBED

By November 1938 the twin-float assembly was accepted as standard and the ten B-series aircraft left the production line soon afterwards. The floatplane's structure was conventional, the wing was a two-spar all-metal structure with metal skinning and the fuselage was built around a rectangular-section steel-tube structure, faired to an oval cross-section by formed ribs. Stressed skinning was used to cover the forward fuselage while the rear section was covered in fabric. Catapult attachment points were fitted beneath the fuselage enabling the aircraft to be launched from catapult-equipped ships.

The wings were hinged at the trailing-edge root and the inclined inverted vee-struts bracing the wings to the floats at one-third span were also hinged at their wing attachment points, the struts being detached at the floats and hinged inwards prior to wing folding. When in the folded position the wings lay alongside the aft fuselage at an angle of 45 degrees to the vertical. Dimensions were as follows: span, 12.4m, length 11m, height 4.45m, wing area 28.5m2.

The single-step hydronaluminium floats were each divided into seven water-tight compartments and, in addition to a 300 litre fuel tank, each float contained a smoke canister and a stowage bin; as a matter of interest, the central-float version of the Ar 196 housed a single 600 litre fuel tank. The two-man crew sat under a continuous canopy with the aft-facing gunner manning a single 7.9mm MG 15 machine gun. Offensive armament consisted of a pair of 50kg SC 50 bombs fitted to underwing racks outboard of the float bracing.

Power was provided by a BMW 132K engine providing 950hp at 2,350rpm at take-off and 970hp at 450 metres; normal cruising power was 690hp at 2,100rpm at 1,50m. This enabled the aircraft to reach a maximum speed of 310km/h at 4,000m for a range of 1,070km; service ceiling was 7,000m.

IN SERVICE

Deliveries soon commenced and the first to put to sea with the new Ar 196A-1 was the pocket battleship Graf Spee. All 20 aircraft had left the assembly line by the end of 1939. Other battleships to carry the Ar 196 included the Admiral Scheer, Deutschland, Gneisenau, Prinz Eugen, Admiral Hipper and the Scharnhorst, mainly replacing the ageing He 60s that had been in service up to that time. The first deliveries of the Ar 196A-1 went to Bordfliegerstaffeln 1./196 and 5./196 which were under the control of the Kriegsmarine and were based at Wilhelmshaven and Kiel-Holtenau respectively.

Then followed a version intended for the Küstenfliegerstaffeln of the Luftwaffe, the Ar 196A-2, which was charged with the tasks of harassment of RAF Coastal Command aircraft, anti-shipping and protection of German convoys. In fact, this example started being delivered in early 1940 and introduced the pair of 20mm cannon, one in each wing. First Luftwaffe unit to receive this version was 1.Staffel of Küstenfliegergruppe 706, joining its fleet of He 115 floatplanes, and went immediately into action at Aalborg with the occupation of Denmark. A pair of Ar 196A-2s from this unit were instrumental in the capture of the Royal Navy (RN) submarine 'Seal' on 5 May 1940. It was spotted and attacked after it had suffered damage while laying mines in the Kattegat. Following a bomb and cannon fire attack the submarine crew surrendered, one of the Ar 196s landing alongside and taking the submarine's commander prisoner and flying him to Aalborg; later the submarine was towed into Frederikshaven harbour in Denmark.

By 1941 the Arado floatplane was being met increasingly both in the air and at sea by Allied forces and this early operational experience had shown up the necessity of some structural strengthening. This, together with provision of additional radio equipment in the form of FuG 16 Z, and the replacement of the propeller with a VDM type, spawned the Ar 196A-3 whose deliveries commenced in the spring of 1941. Its equivalent for use from catapults at sea was the Ar 196A-4 whose deliveries in actual fact preceded those of the A-3. Early in 1943 the Ar 196A-5 sub-type appeared and this was to be the definitive version of this floatplane. It was similar to the A-3, yet it offered improved defensive armament and more reliable radio equipment.

A small quantity was also built by the Société nationale de Constructions Aéronautiques, the French plant at St Nazaire where tooling had been completed by 1942. The first Ar 196A-3 left this plant in July and a dozen more examples were completed by the end of that year. In March 1943, however, the French plant was closed down and production transferred to the Fokker facility at Amsterdam from where 11 examples were delivered by the end of that year. Soon afterwards Arado phased out its Ar 196 plant, production continuing exclusively at Fokker's plant.

During the Bismark episode, its Arado Ar 196A-4s provided the battleship with the best aerial protection they could possibly give, especially in attempts to drive away RAF Catalinas continually shadowing the vessel after it had entered the Atlantic. It was to be the one and only sortie from Bergenfjord of what was then considered to be the most powerful warship in the world, as it was eventually sunk on 28 May 1941.

Meanwhile the Luftwaffe's A-3s, in conjunction with He 114As operating from French Biscay coastal areas, continuously hunted RAF Coastal Command Whitleys, which in turn were trailing and hunting German U-boats. Two new units were formed to operate the type, namely 2./SAGr 125 operating within Fliegerführer Ostee in the Baltic while 2./SAGr 131 operated the type in conjunction with Blohm und Voss BV 138 flying boats from Norway.

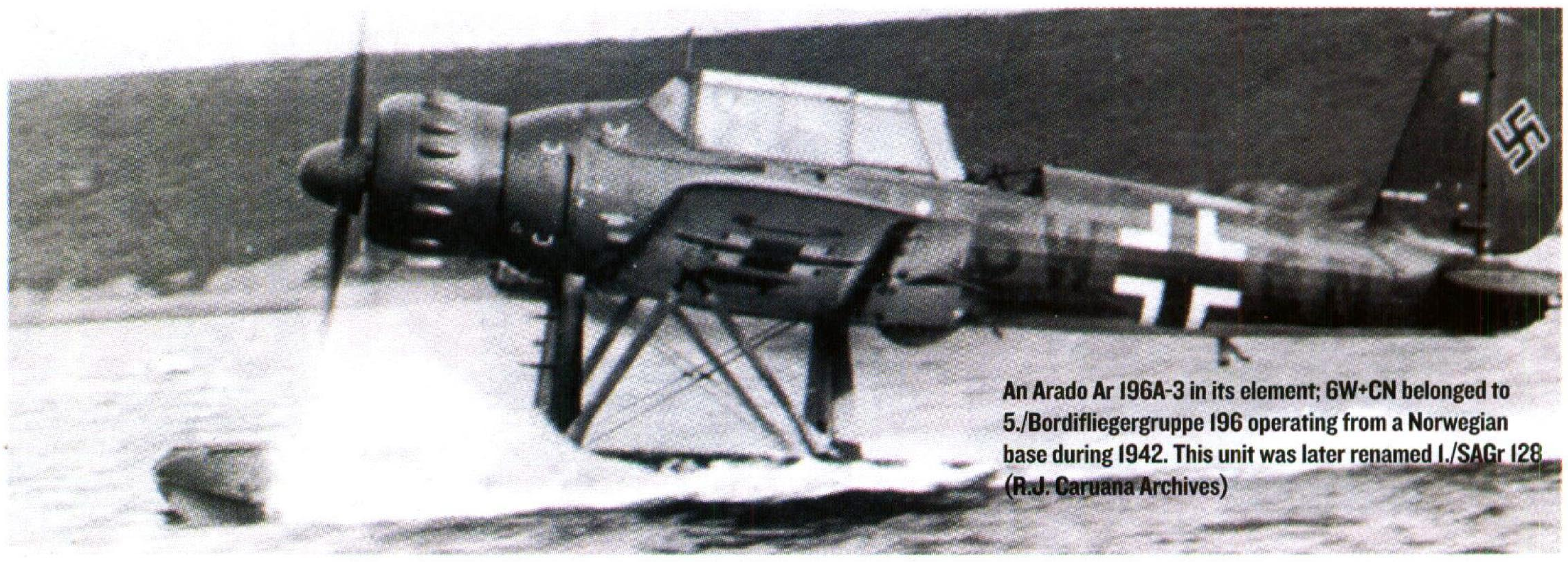
During the first half of 1943 Bordfliegerstaffel 5./196 was redesignated 1./SAGr 128 while another unit, 2./SAGr 128, was formed.

EXPORTS AND FINAL SERVICE

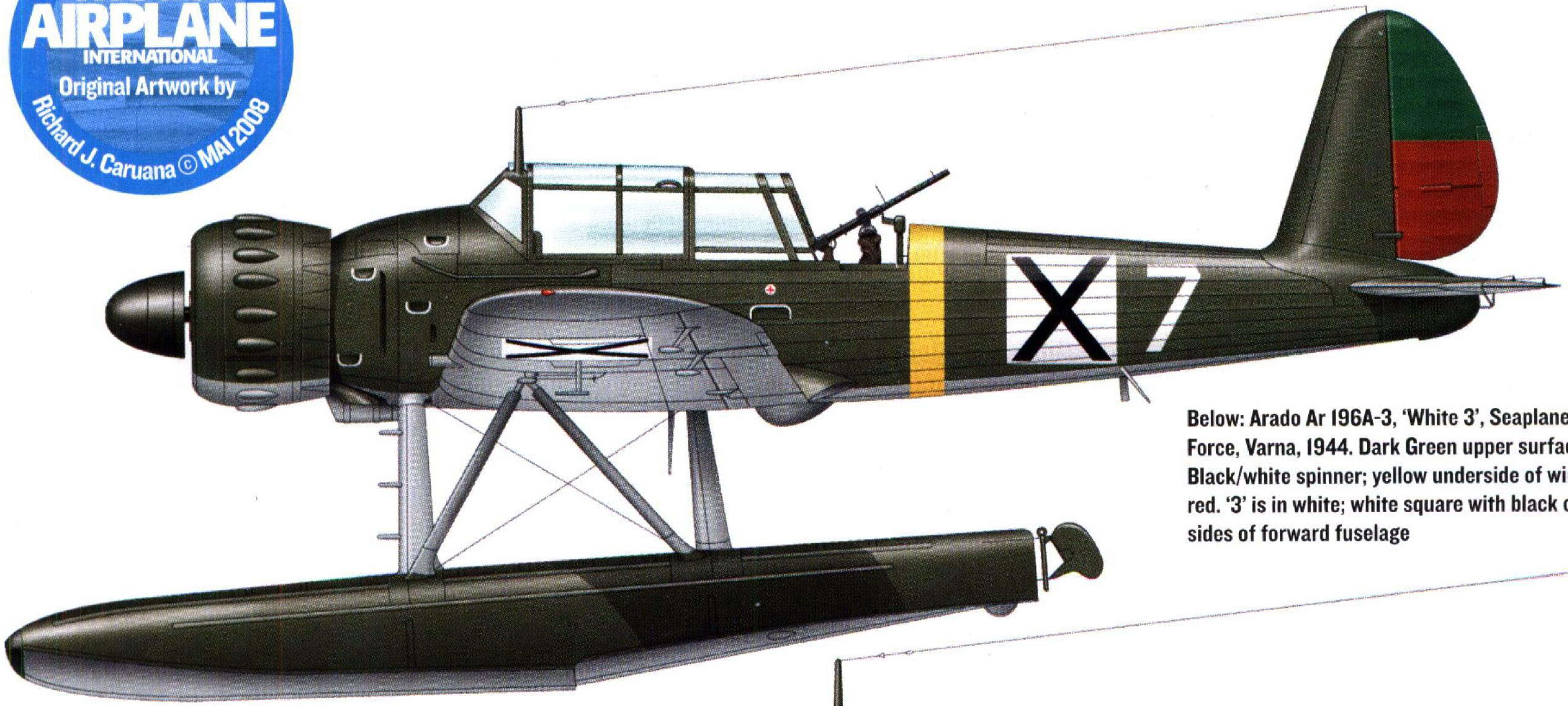
There were two other air arms that received limited quantities of the Arado floatplane. The first was the Bulgarian Air Force, which utilised the Ar 196A-3s to form 161 Eskadra based at Varna in the spring of 1943. The other country was Rumania with its A-3s forming Escadrila 102, a coastal squadron operating from Odessa in 1943.

By early 1944, the days of the Arado were definitely numbered. Many feel that it was the most successful naval aircraft of the Second World War, yet by that time it had become easy prey to the nimble Beaufighters and its operations were severely restricted. In consequence the last Ar 196 left the Warnemünde production line in March 1944 and during the following August the Fokker line closed down as well. A total of 526 aircraft had been built.

The Ar 196 acquitted itself honourably throughout its service life. It served with distinction under some of the most arduous conditions and throughout it proved that it was sturdy and reliable. For many years it had served as the 'eye' in the sky of the German Navy, the exact role for which it had been designed, yet it proved itself to be an equally perceptive 'eye' for the Luftwaffe as well. ■

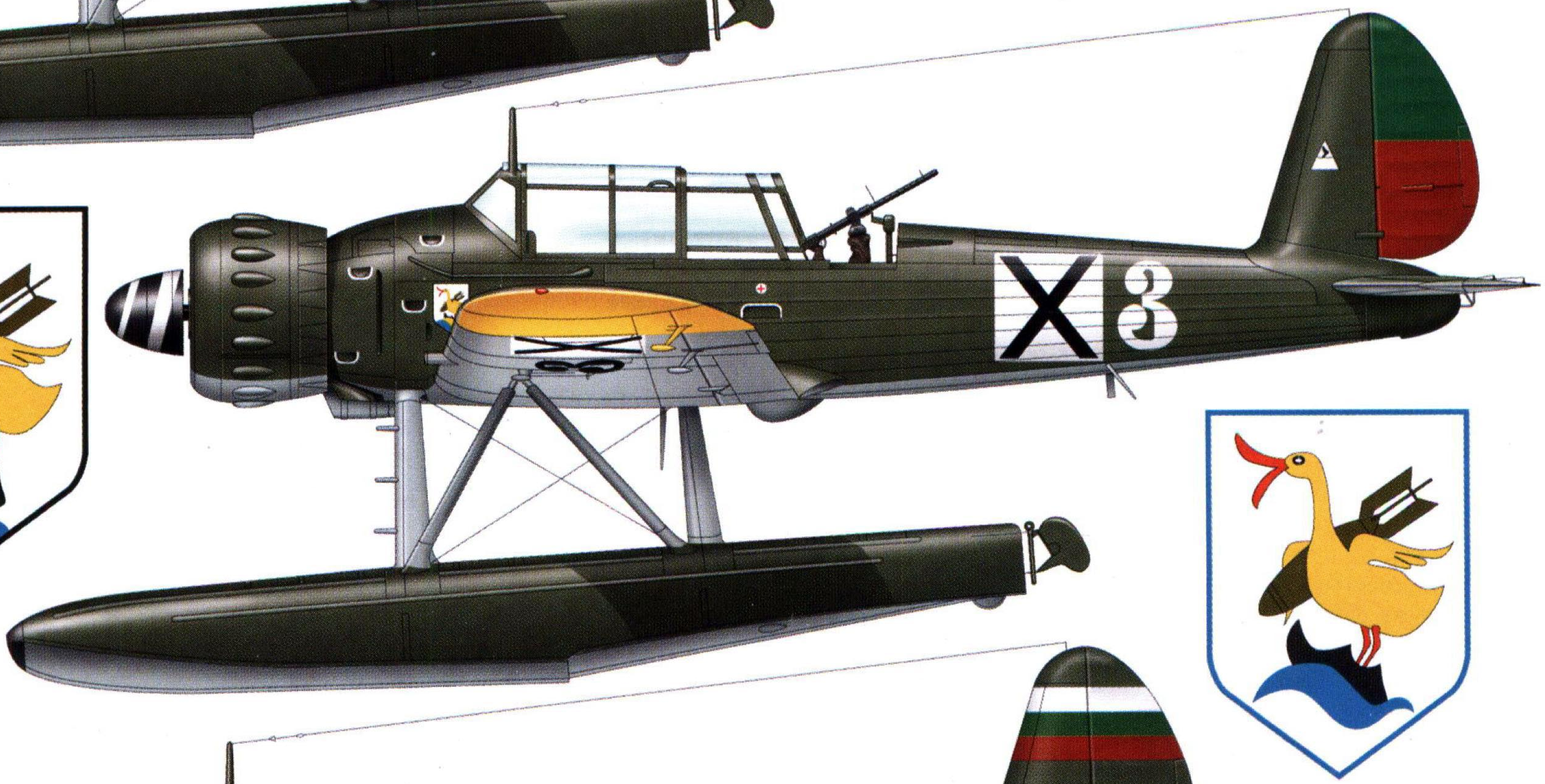

An Arado Ar 196A-3 in its element; 6W+CN belonged to 5./Bordfliegergruppe 196 operating from a Norwegian base during 1942. This unit was later renamed 1./SAGr 128 (R.J. Caruana Archives)

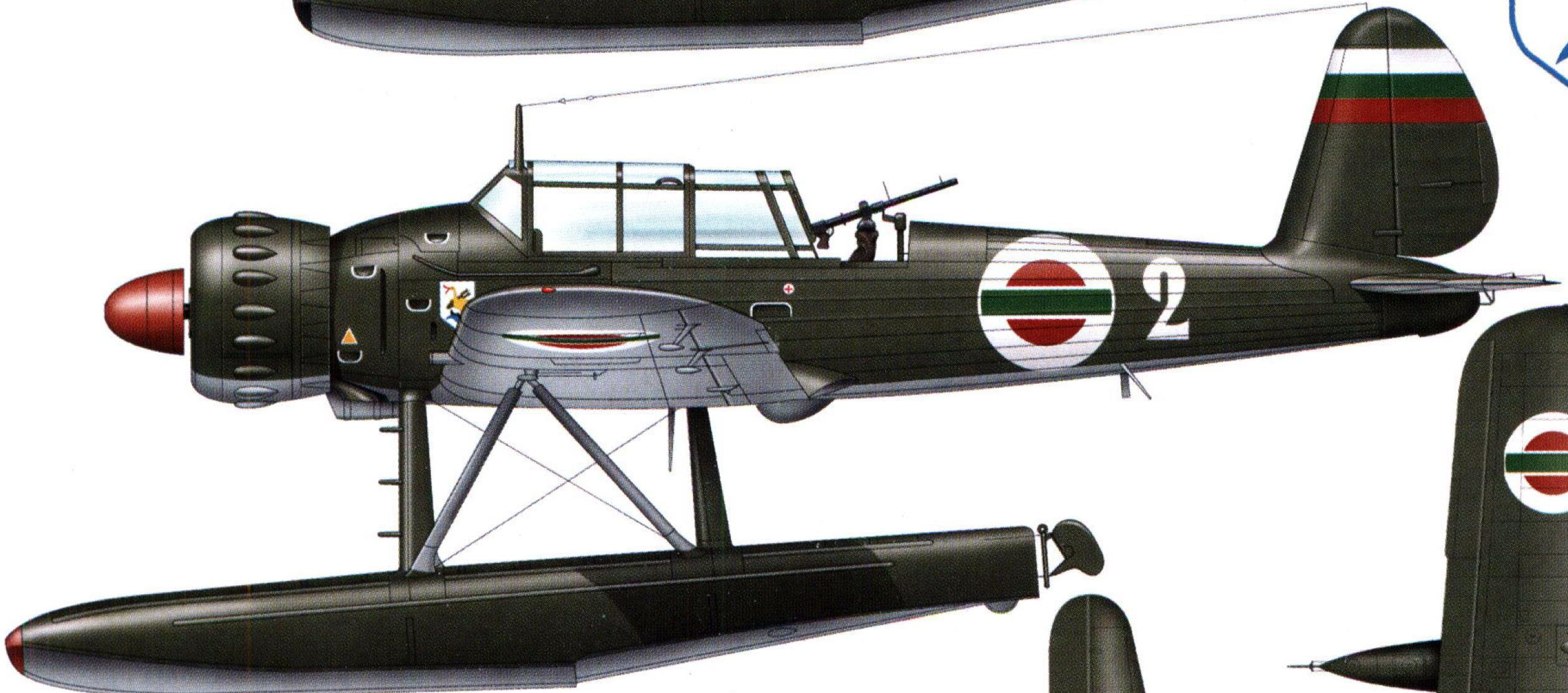
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2008

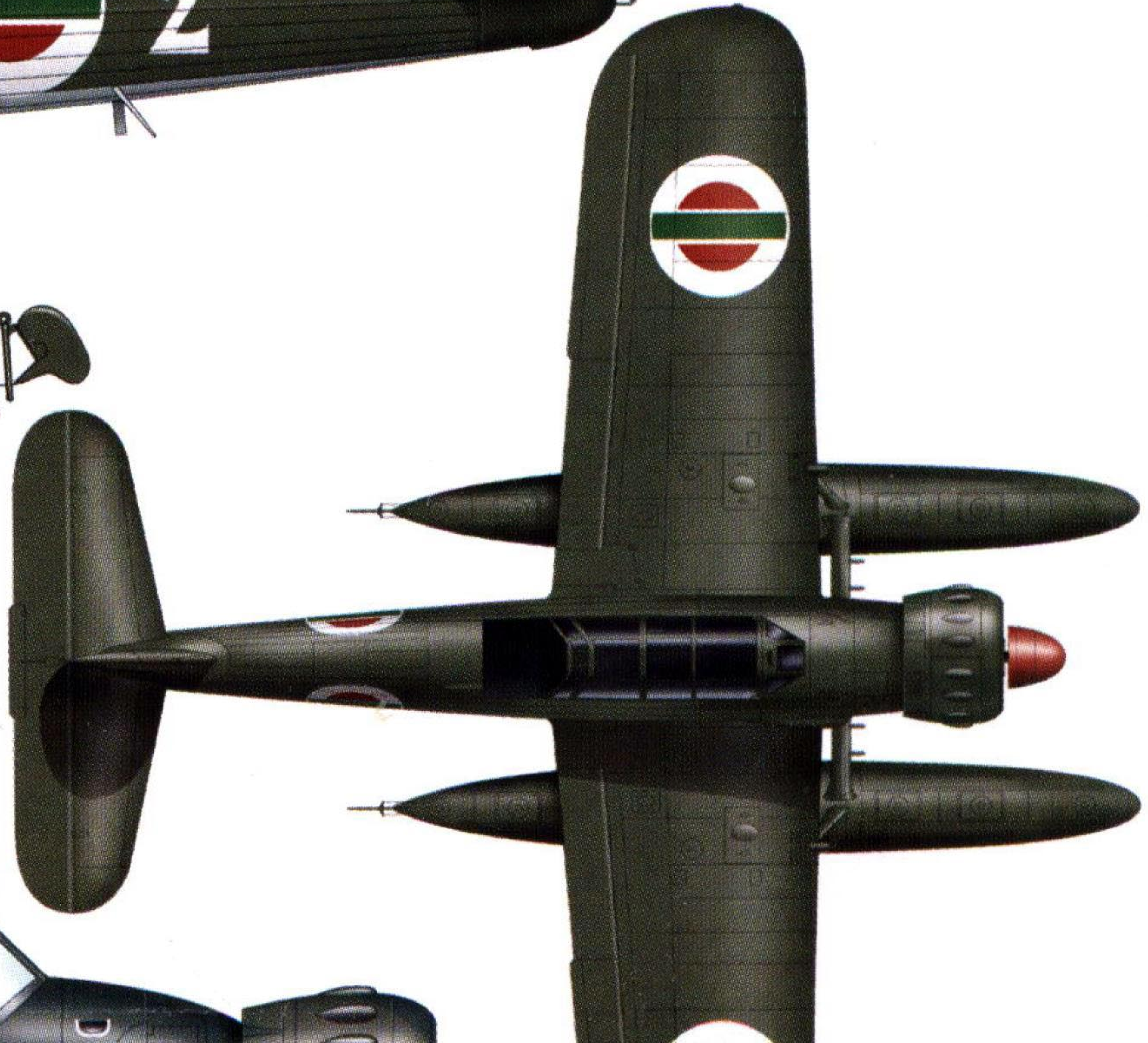


Arado Ar 196A-3, 'White 7' of 161 Squadron, Royal Bulgarian Air Force, Varna, April 1943. Dark Green upper surfaces with light blue-grey undersides. Black-green spinner; yellow fuselage band. Rudder is green (top) and red. '7' is in white; white square with black cross in six positions

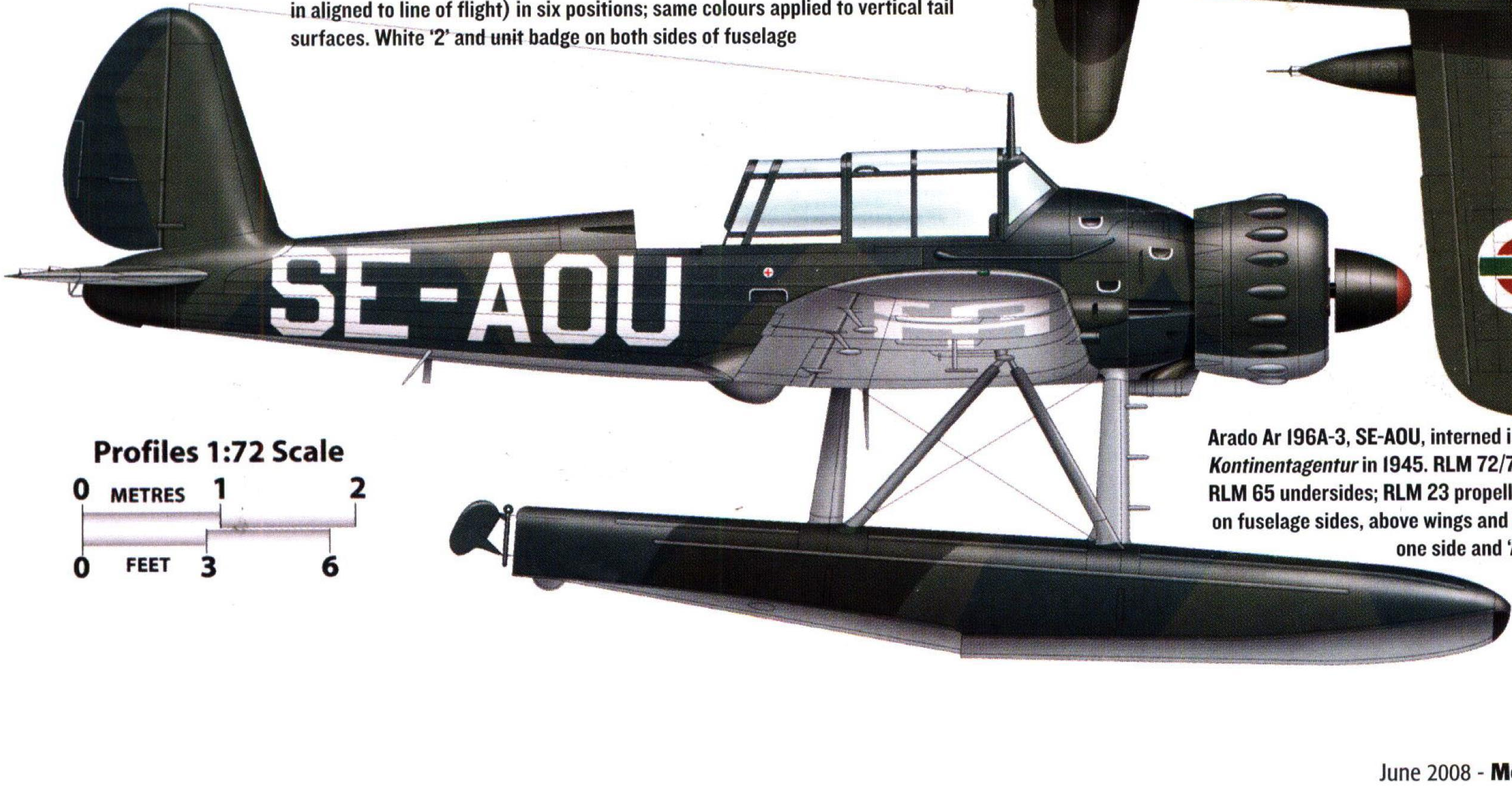
Below: Arado Ar 196A-3, 'White 3', Seaplane Squadron, Royal Bulgarian Air Force, Varna, 1944. Dark Green upper surfaces with light blue-grey undersides. Black/white spinner; yellow underside of wingtips. Rudder is green (top) and red. '3' is in white; white square with black cross in six positions. Badge on both sides of forward fuselage







Above & Right: Arado Ar 196A-3, 'White 2', Seaplane Squadron, Royal Bulgarian Air Force, Varna, 1945. Dark green upper surfaces with light blue-grey undersides; red spinner and front tip of floats. Red/white/Green roundels (green stripe always in aligned to line of flight) in six positions; same colours applied to vertical tail surfaces. White '2' and unit badge on both sides of fuselage



Profiles 1:72 Scale

0 METRES 1 2

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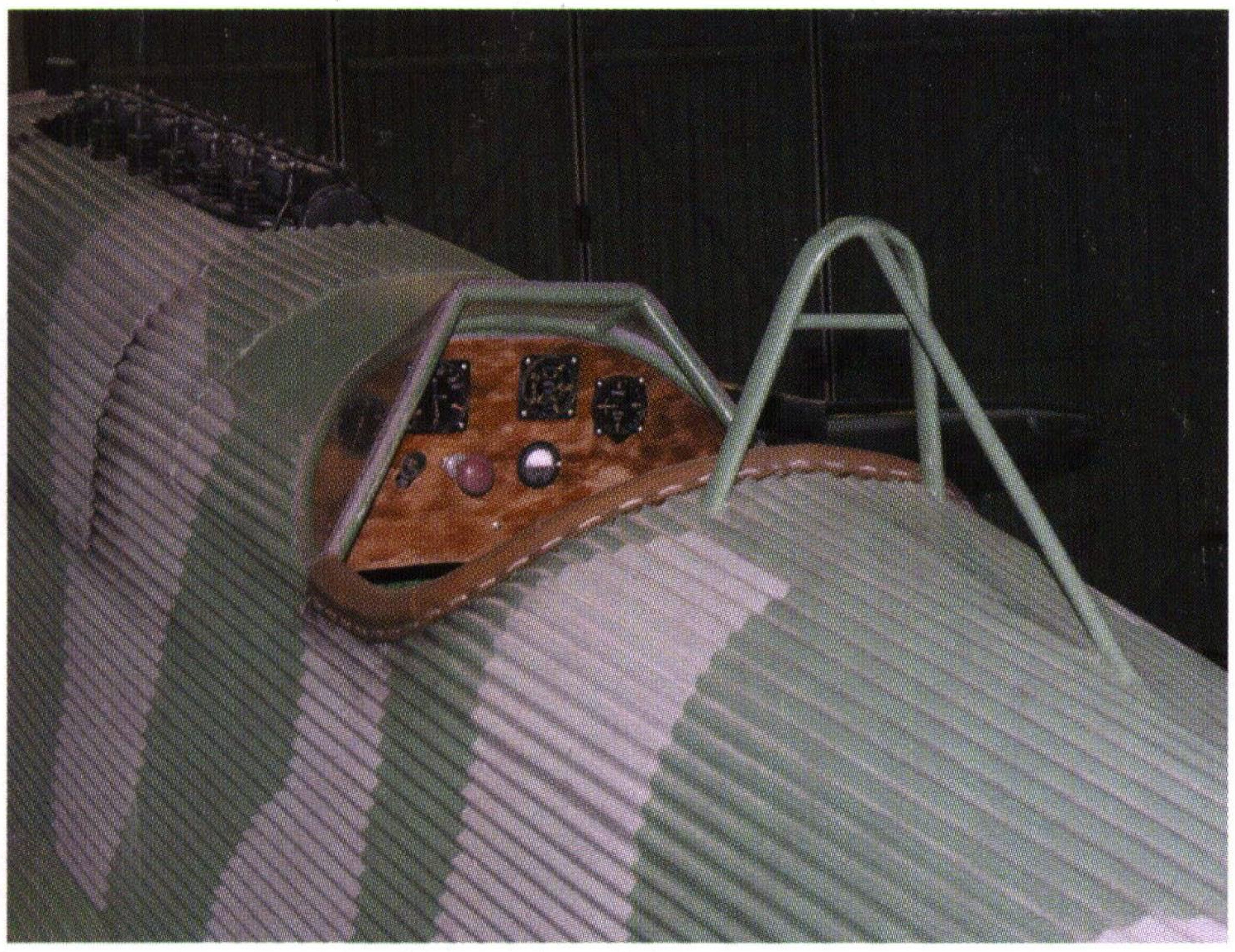
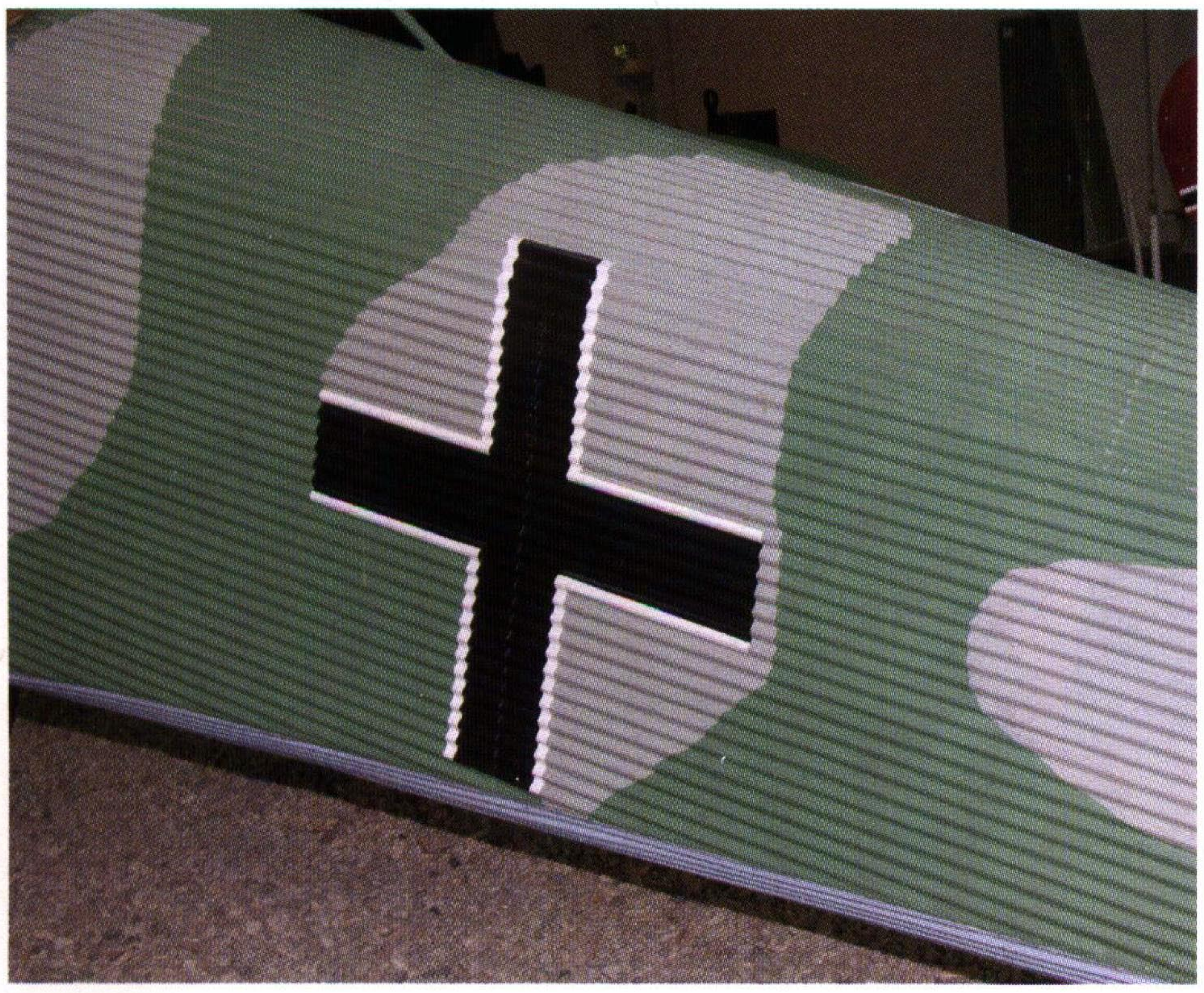
Arado Ar 196A-3, SE-AOU, interned in Sweden in 1943 and acquired by *Kontinentagentur* in 1945. RLM 72/73 upper surfaces with RLM 65 undersides; RLM 23 propeller spinner tip. Registration in white on fuselage sides, above wings and below (the latter divided as 'SE-' on one side and 'AOU' on the other)

1:1 REFERENCES

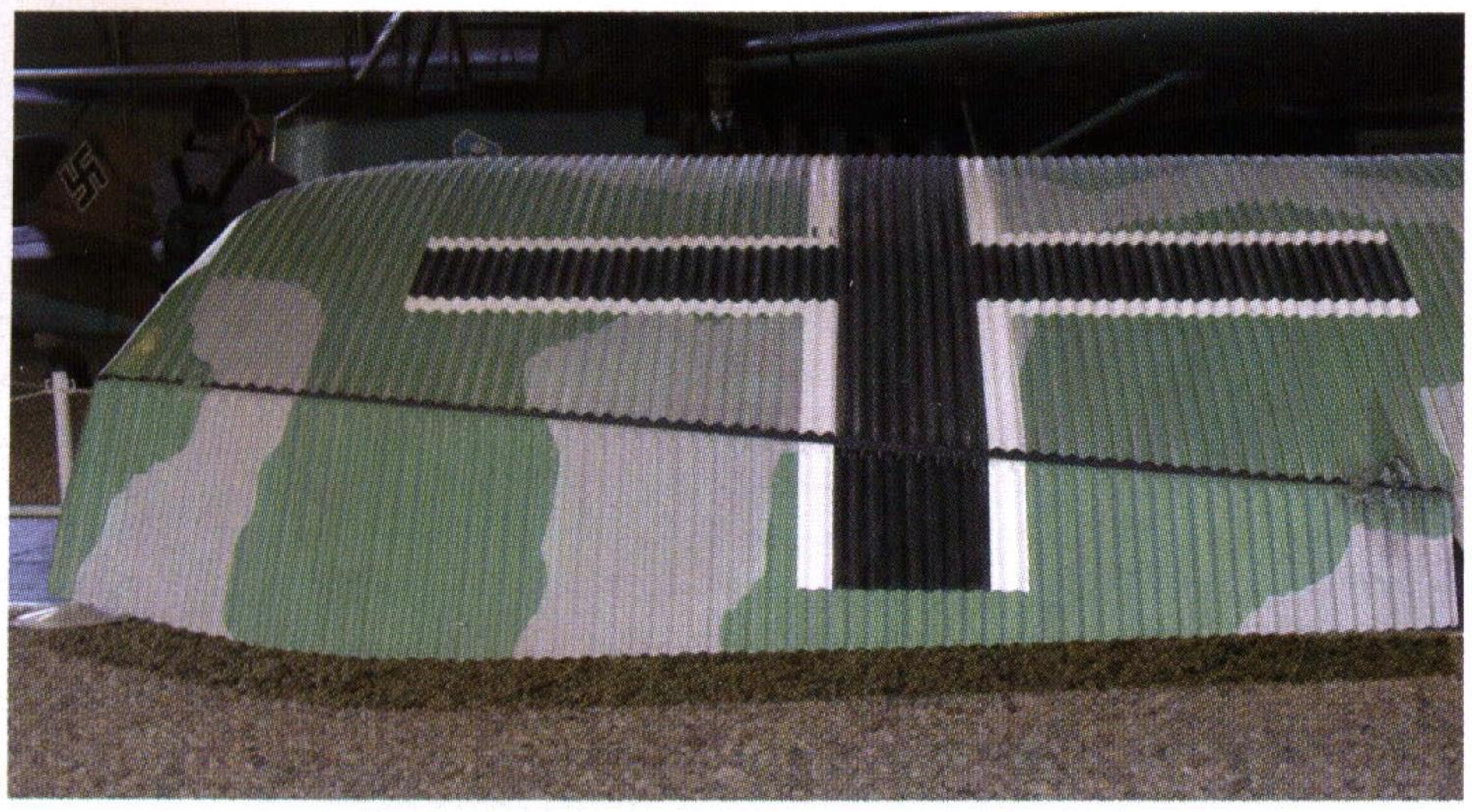
No genuine D.Is exist today, so the following selection of images are of the replica currently on show at the Berlin-Gatow aviation museum in Germany
All photos © Przemyslaw Skulski



This shot into the cockpit shows the very basic instrument panel; in this replica it is wooden



The corrugations on the fuselage sides



The ailerons, with the crosses painted over wing and aileron. Once again the corrugations on ailerons of this replica match those of the wing

The front cowling with the radiator in the upper section and the two intakes below, note the use of the corrugation edges for the demarcation

The vertical fin (no rudder) and the elevators, note the flat skinning for the tail cone section. On this replica the corrugations of the elevators match those of the tailplanes

Avro Lancaster B.Mk.I, R5570/EM-F, No. 207 Squadron, June 1942. Dark Earth/Dark Green upper surfaces with Night undersides; codes in Medium Sea Grey, serial in Ident Red. Early style national markings, 'B' type roundels above wings. Lost during a raid against Turin (Italy) on the night of 8/9 December 1942

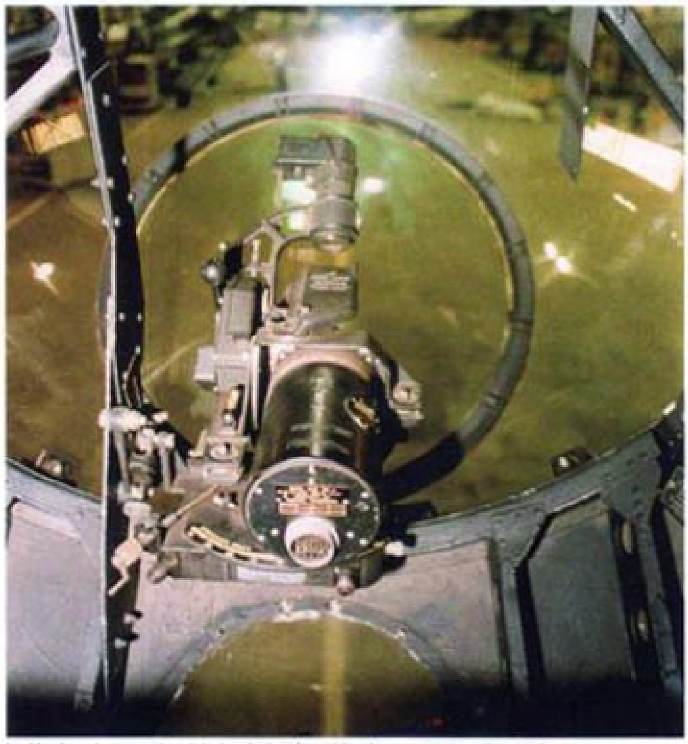
Avro Lancaster Mk.I, NG142/A2-H, 'The Lancashire Lass', 'C' Flight, No. 514 Squadron, Waterbeach, autumn 1944. Dark Earth/Dark Green upper surfaces with Night undersides; codes and serial in Ident Red. Spinners in light blue; white name beneath cockpit

Avro Lancaster B.Mk.III, LM624/DX-A, No. 57 Squadron, East Kirby, early 1945. Dark Earth/Dark Green upper surfaces with Night undersides; Ident red fin markings (inner and outer faces). Ident Red codes, outlined in yellow; Ident Red serial and 'A' on nose (aft of small side window

Avro Lancaster B.Mk.III, ND968/G, AR-O of No. 460 Squadron, Royal Australian Air Force, Binbrook, 1945. Dark Earth/Dark Green upper surfaces with Night undersides; 67 mission markings, consisting of red bombs with yellow wings, and name 'BERYL' in white on nose. 'O' repeated in white aft of the nose side window

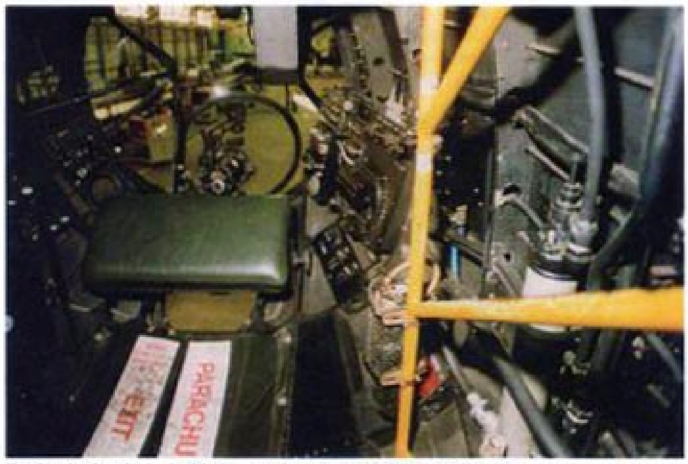
Avro Lancaster B.Mk.III, JA845/FCX-T, Empire Flying School, Hullavington, Autumn 1946. Dark Earth/Dark Greeen upper surfaces with Night undersides; yellow rectangle on fuselage with codes in black (reading FCX•T on starboard side). Post war bright coloured national markings in all positions; EFC crest on both sides of nose. Serial in white, repeated below wings; wartime mission markings in white faintly visible on nose

1:1 Reference - The following photographs are of the B Mk I (FE) operated by the BBMF. Being a machine destined for the Far East, hence the 'FE' designation, this airframe has a number of items of equipment that were not seen on wartime Bomber Command machines, but these will be highlighted in the accompanying captions.

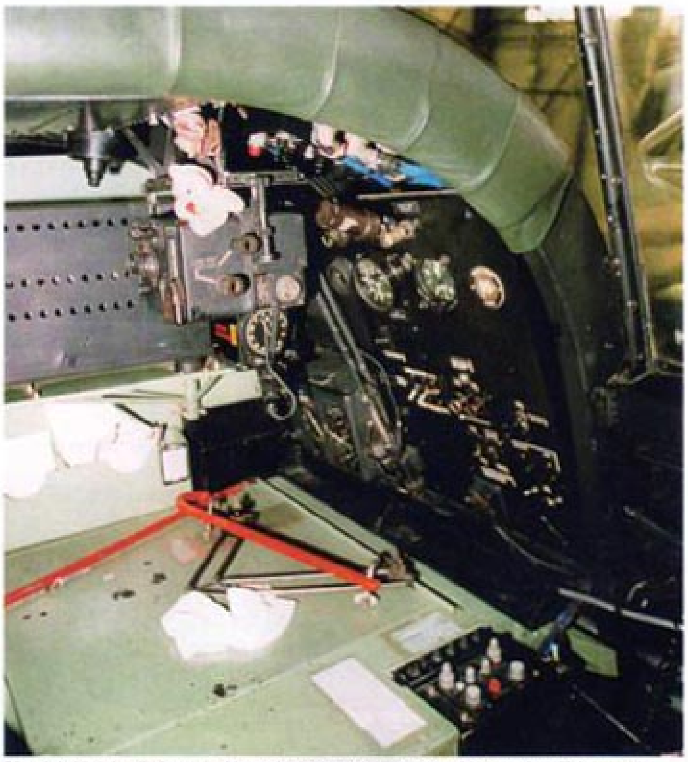


Looking into the extremity of the bomb aimer's position, here you can see the prominent computor bombsight

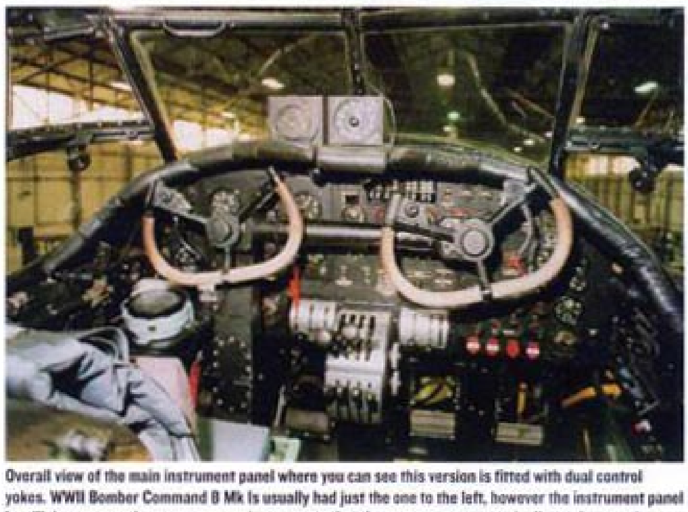
Here is the Flight Engineer's (or second pilot's) station on the starboard cockpit side. Most of this area is dominated by the engine gauges, with four of each, but there are also magneto switches and other electrical distribution controls plus a shielded cockpit lamp (the brass item just alongside the backrest cushion). The crew seat is in the stowed position



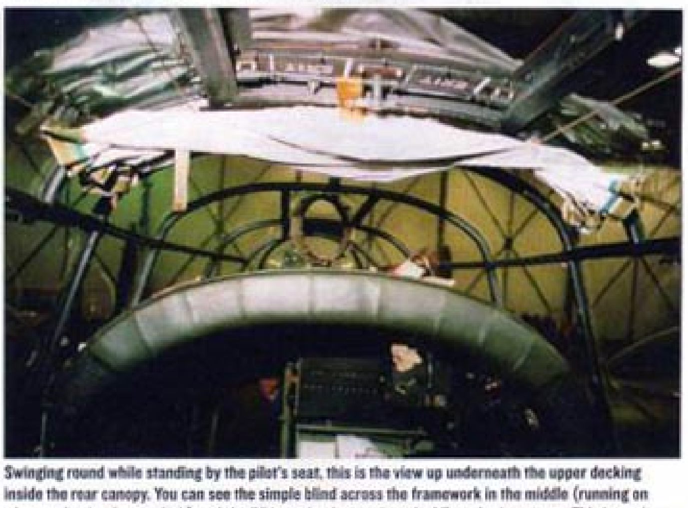
Here is a shot from further back in the nose where you can see the structure inside the nose blister and the various electrical distribution panels on the sidewalls. The parachute exit is just behind the kneeling pad and being an FE version the sighting panel below this is oval, not square as it was with most Bomber Command B Mk Is



Directly behind the pilot's seat in this version is the navigator's table with the various flight controls duplicated plus his Gee control box. In most wartime Lancs this area was filled with radar and radio navigation 'black boxes' and there was usually an anglepoise lamp



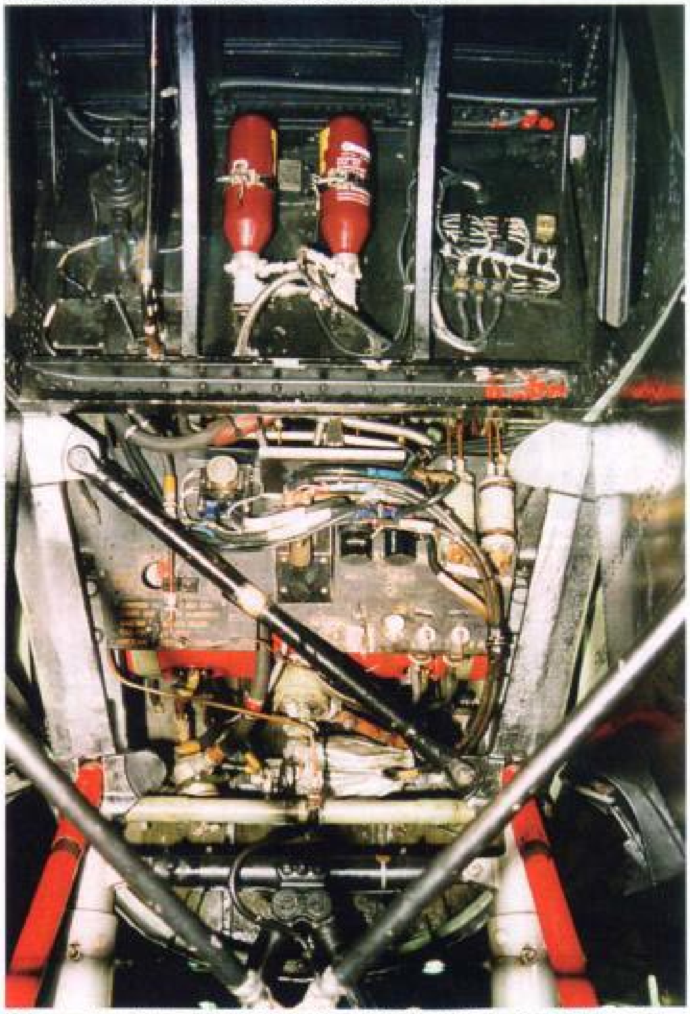
Overall view of the main instrument panel where you can see this version is fitted with dual control yokes. WWII Bomber Command B Mk Is usually had just the one to the left, however the instrument panel is still the same as there are so many instruments that there was not space to duplicate them on the right when the dual controls were used. This machine does also have a duplicate set of rudder pedals under the right lower edge of the panel, which would not be in wartime B Mk Is



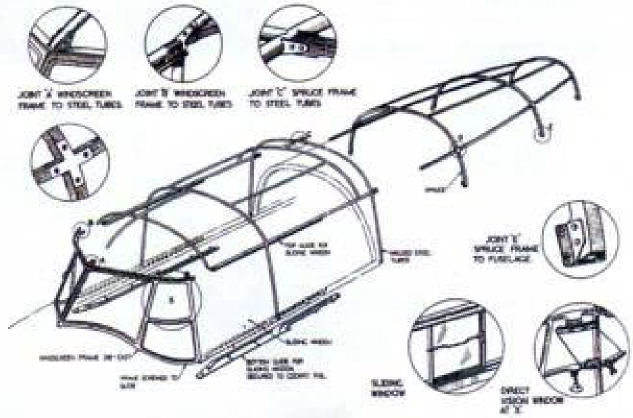
Swinging round while standing by the pilot's seat, this is the view up underneath the upper decking inside the rear canopy. You can see the simple blind across the framework in the middle (running on wires projecting fore and aft) and the DF loop that juts up into the blister in the canopy. This latter item is a late-war addition, and may not be present on all wartime Lancs

All photos ©Richard A. Franks

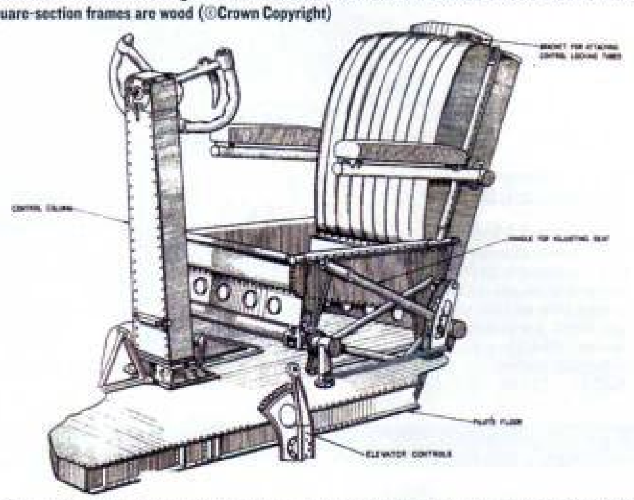
Here is the classic radio operator's position just behind the flight deck and in front of the main spar (the green object running along the whole of the bottom edge of this image). The usual transmitter/receiver combination of the 1154 and 1155 dominate his desk, with a Morse key to the right and his H2S scope to the left. The tube to the left is linked to the oxygen economiser mounted further back, and to the left of the astrodome at the top of the picture is mounted his signalling lamp



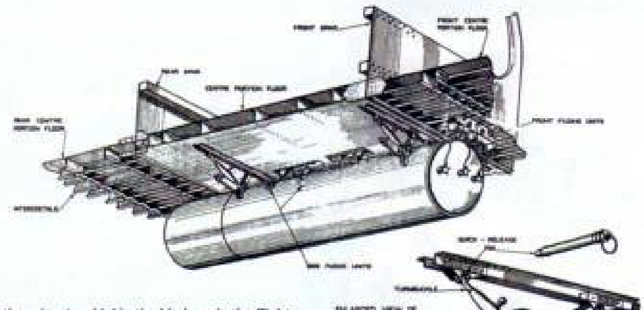
For those mad enough to consider it, this is the view up inside the roof of the main wheel well, looking forward. The extinguishers are mounted on the mid-spar, while the pipework and instruments forward of this are actually mounted on the back of the engine bulkhead. The red struts at either side of the bottom of the picture are ground locks and these were removed prior to flight



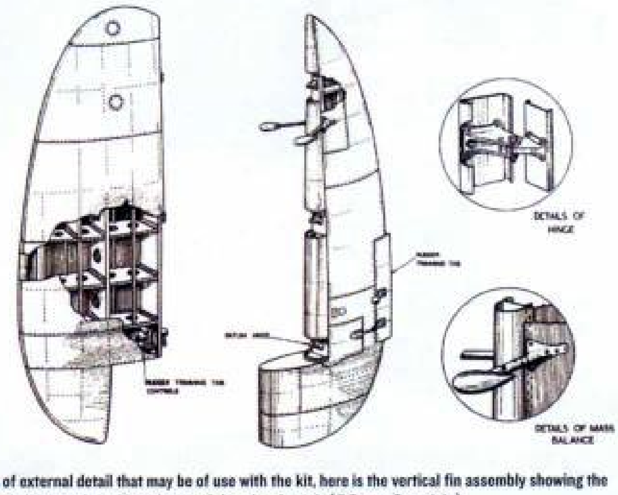
Having shown you what the canopy interior looks like in the BBMF machine, here is the wartime diagram of its construction from the flight manual. Note how much of the framework is inside and that all the square-section frames are wood (©Crown Copyright)



As it is not the easiest thing to photograph, here is the diagram from the flight manual of the pilot's seat. In this instance the head armour is not shown (©Crown Copyright)



As there is a 'cookie' in the kit, here is the flight manual diagram of this installed and fused within the bomb bay, showing both the suspension lugs and the sway braces (©Crown Copyright)



A bit of external detail that may be of use with the kit, here is the vertical fin assembly showing the mass-balance style and locations and the trimming tab (©Crown Copyright)

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A-10A, S/No.75-0259, WA, 57 TTW, 'Exercise Jaws', November 1977. FS.36331, 34052, 30118, 34502 and 30277 in a mottled finish; national markings in Gunship Grey. Yellow/black checks on fin; all other markings in black. Note simplified TAC badge on fin

A-10A, S/No.80-0204, WR, 91st TFS/81st TFW, Woodbridge (England). 'Lizard' wrap-around scheme in FS.34102/34092/36081; blue top of fin. Pilot's name in white on a blue rectangle, edged in white, below cockpit; national markings in Gunship Grey. Unit marking above national marking on fuselage

A-10A, S/No.80-0149, IN, 45th TFS, D-Day 50th Anniversary commemorative scheme, 1994. 'Lizard' wrap-around scheme in FS.34102/34092/36081 with blue/yellow fin/rudder tops; black/white bands around engine pods and inboard wing sections. National markings in Gunship Grey; all other lettering in black, with '149' repeated in white on nose. Unit badge on forward fuselage

A-10A, S/No.81-0963, SP, 81st TFS, 52nd FW, Spangdahlem (Germany), 2001. Two-tone grey scheme in FS.36375/36320 with markings in Gunship Grey; black fin top with yellow lightning flash. All lettering in black; unit badge on engine pods in black and white

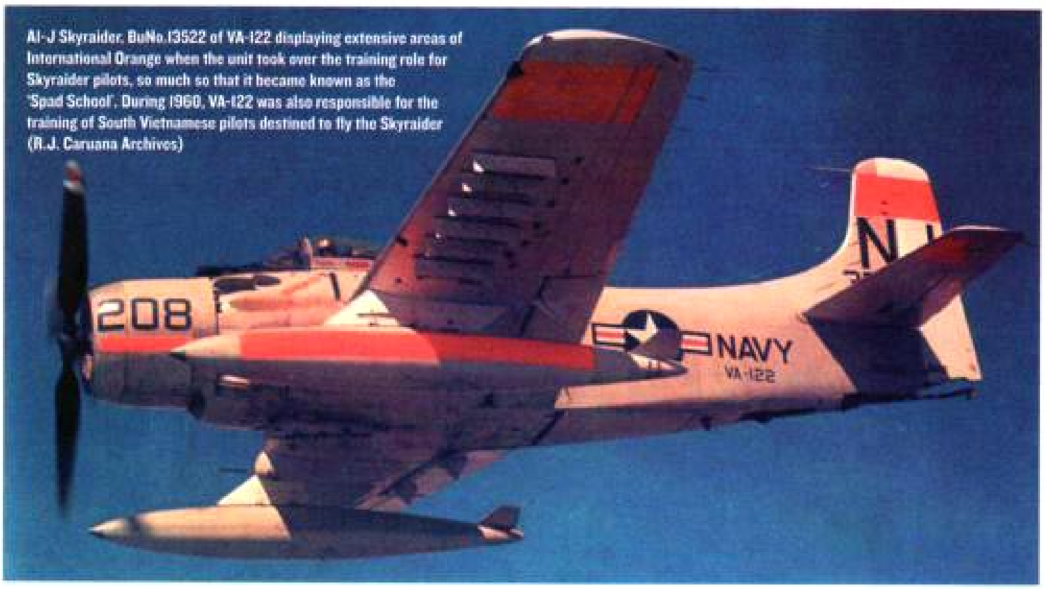
Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

DOUGLAS' ABLE-DOG

The Skyraider was the ultimate loiterer, with an over-target endurance of 7hrs and many a downed pilot owes his life to the top cover provided by the Spad while awaiting recscue



AI-J Skyraider, BuNo.13522 of VA-122 displaying extensive areas of International Orange when the unit took over the training role for Skyraider pilots, so much so that it became known as the 'Spad School'. During 1960, VA-122 was also responsible for the training of South Vietnamese pilots destined to fly the Skyraider (R.J. Caruana Archives)

'Able-Dog' is hardly the prettiest of names bestowed upon an aircraft but the Douglas Skyraider's nickname was probably coined after its crews realised that it possessed some unique characteristics among aircraft of its size and role, not least of which was its the ability to take great punishment and get its jockey back safely to base. Few aircraft born towards the end of World War II had such a successful career, combined with a longevity that became the envy of crews flying more 'modern' equipment, which at times was designed to replace it in service.

The AD-series traces its origins to 1944, in most part in a determination not to succumb to disappointment when Douglas Aircraft Company's XSB2D Destroyer programme for the Navy was cancelled. In conformity with the changing pattern of the war in the Pacific, the US Navy was, at that time, seeking a very different attack aircraft to be embarked on its carriers. The original formula called for a two-seat Scout Dive-Bomber. However the requirement was changed to that of a single-seat Dive-Bomber Torpedo Attack aircraft and proposals from other manufacturers had already been requested. Ed Heinemann, Chief Engineer of Douglas's El Segundo Division, sat down in a Washington DC hotel room with his Chief Aerodynamicist Gene Root, and Chief Designer Leo Devlin determined not to be left out of the action, even though their company had not been officially invited to tender.

They had just been informed that Douglas would be considered in this bid only if they could make their submissions without further delay. Working overnight, Heinemann and his team managed to produce preliminary drawings which, when presented the following day, were so full of promise that Douglas were allowed to compete if they guaranteed that they could keep to the original deadline. This situation did not allow Douglas any extension to make up for the head start that its competitors enjoyed.

Competing for what promised to be a very lucrative US Navy contract were Martin with its XBTM powered by a 3000hp Pratt & Whitney R-4360, Curtiss with the XBT2C which was an updated version of its Helldiver (see MAI-18, January 2007), Kaiser Fleetwings' XBTK powered by a Pratt & Whitney R-2800 (which was very much in the light category), and Boeing with the XF8B similarly powered to Martin's offering. Engineering design was scheduled for completion by January of 1945.

Lessons learnt from the war had to be incorporated into the new aircraft and these, in synthesis, translated to better power-to-weight ratio, which was to be attained by higher efficiency from both wing-lift and weight control. Design gross weight was cut down from the original 18,000lb to 16,500lb, with a target for a possible further reduction of 750lb. Designated as the XBT2D-1, the aircraft actually weighed out at 15,500lb, 1,000lb less than originally planned. It had originally been intended to fit a Wright R-3350-24 engine providing 2,500hp. It was eventually decided to install the more reliable Wright R-3350-8 which, however, produced 200hp less. Armament consisted of a 20mm cannon and three pylons beneath each wing together with another pylon beneath the fuselage centreline. The prototype flew for the first time on 18 March 1945, two weeks ahead of schedule, and immediately proved to posses immense potential for the making of a true thoroughbred. Trials at the Naval Test Centre, Patuxent River, started on 7 April 1945, and immediately reports began to flow in the most glowing terms about its overall qualities, going as far as to consider the XBT2D-1 as the best dive-bomber ever tested at that establishment.

Workhorse of the United States Air Force in Vietnam, the AD-5 was a truly multi-mission machine. Here it is being bombed up on a make-shift ramp for another strike against Viet-Cong positions (RJ Caruana Archives)

On 5 May 5 1945 – less than a month since official trials had commenced – the US Navy awarded Douglas with a letter of intent for 548 examples of the BT2D-1s (called Dauntless II), later cut down to 377, and eventually to 277 with the closure of hostilities and VJ (Victory in Japan) Day. Meanwhile Douglas continued with a pre-production series of 25 aircraft, of which 19 were standard XBT2D-1s, while the others were built to fulfil different roles, as if to boldly underline the versatility of the new aircraft's airframe. Two examples were finished as XBT2D-1Ns (Night Attack), one as XBT2D-1P (Photo Recce), one as XBT2D-1Q (Electronic Countermeasures) and one as XBT2D-1W (Early Warning – AEW) fitted with a search radar. The Wright R-3350-8 powered the first four aircraft while the others were fitted with the more powerful R-3350-24W, once its teething troubles had been sorted out. Note that the suffixes used above serve for all subsequent sub-versions.

Since the new Douglas aircraft bore little – if any – relationship to the original Dauntless, the name was changed in February 1946 to 'Skyraider'. The following April the US Navy changed its designation system, the BT2D-1 becoming the AD-1 (which earned the aircraft the affectionate 'Able-Dog' – for AD – appellation).

SKYRAIDER VERSIONS

From AD-1 to AD-7, the transition spanned nearly ten years, and each major sub-type had further sub-versions. It is, therefore, important to cover these one by one:

AD-1

The only changes considered necessary to the prototypes to satisfy US Navy specifications consisted of better cockpit lighting and additional heat and oxygen equipment for the pilot. Service trials at Fleet Air HQ, Alameda, California, brought to light some structural weakness in the undercarriage area of the wing, which had to be beefed up, modifications that were immediately incorporated in aircraft on the production line. Six carriers for the Mk.9 Rocket were added under the wing while there were now two pylons for bombs under each wing, which could take a maximum of 2,000lb each. Deliveries to the US Navy began early in 1947 and production ended in the middle of the following year on the count of 242 machines which went to both Navy and Marines. The only sub-version was the AD-1Q, carrying a crew of two with the second member entering through a door on the starboard side, seated below and aft of the pilot.

AD-2

To completely eliminate the problems related to structural weakness, the AD-2 was extensively redesigned, and

AD-1 Skyraider, BuNo.09283, C-417, VA-63 on board USS Coral Sea, September 1948. Sea Blue Gloss overall with all lettering in white; national markings in white and red only, on fuselage sides, above port and below starboard wings. '417C' repeated above starboard, and below port wing

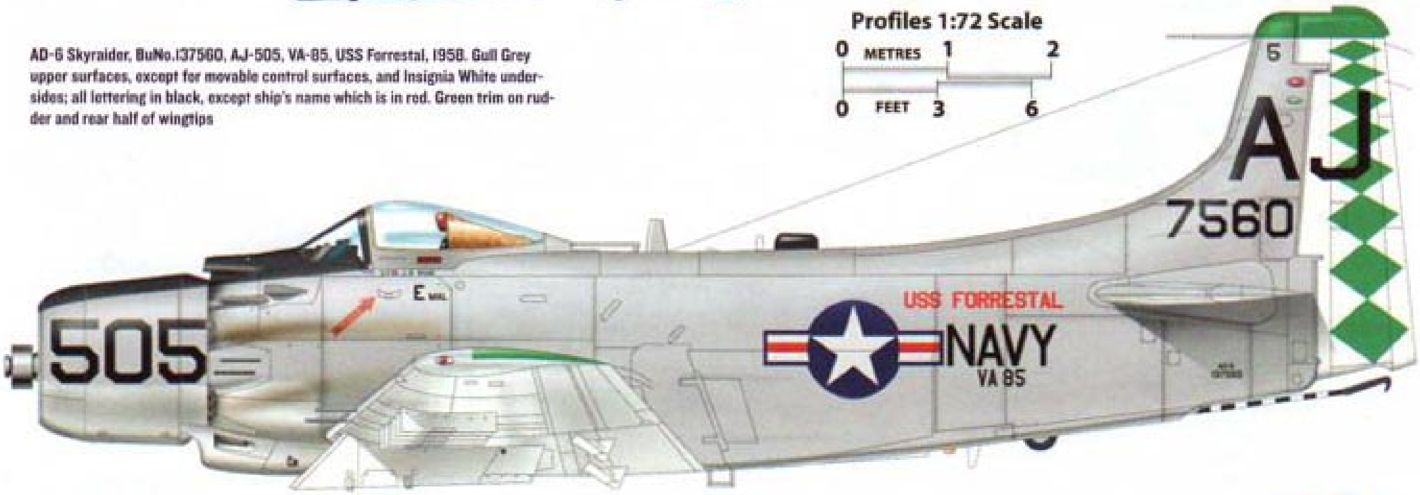
AD-6 Skyraider, BuNo.137618, M-501, VA-65 carrying markings used during the cruise of CVG-2 on USS Essex (CVA-9), 1954/55. Sea Blue Gloss overall with white and green trim on engine cowling, rudder and fin tip; all lettering in white. US Star markings in white and red only in six positions; black anti-dazzle panel

Profiles 1:72 Scale

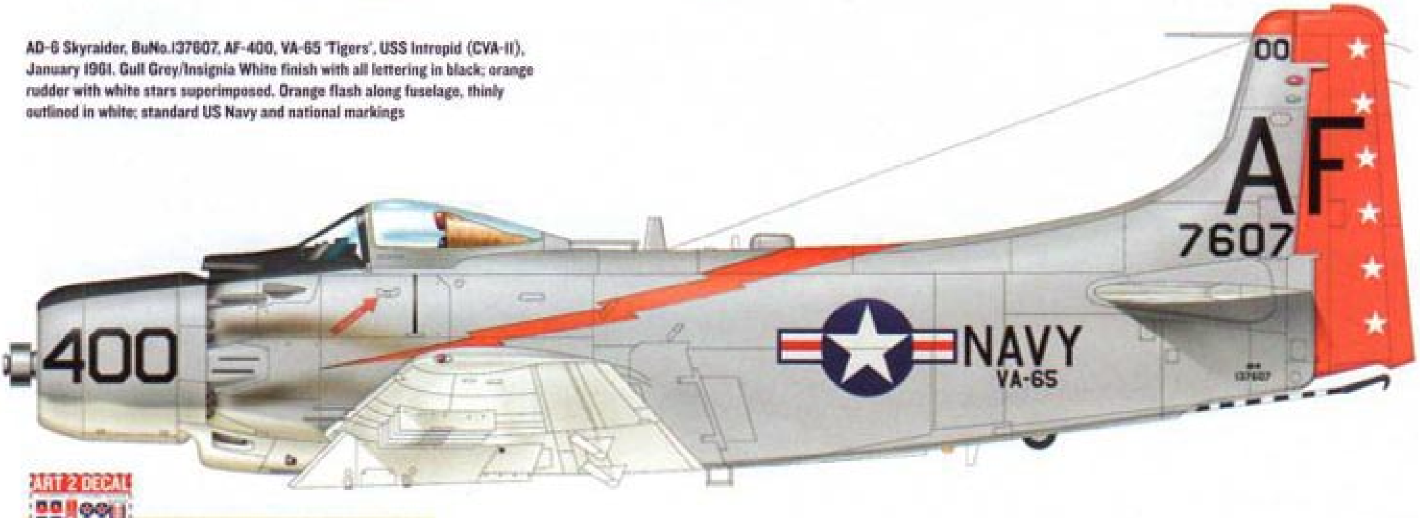
0 METRES 1 2

0 FEET 3 6

AD-6 Skyraider, BuNo.137560, AJ-505, VA-85, USS Forrestal, 1958. Gull Grey upper surfaces, except for movable control surfaces, and Insignia White undersides; all lettering in black, except ship's name which is in red. Green trim on rudder and rear half of wingtips

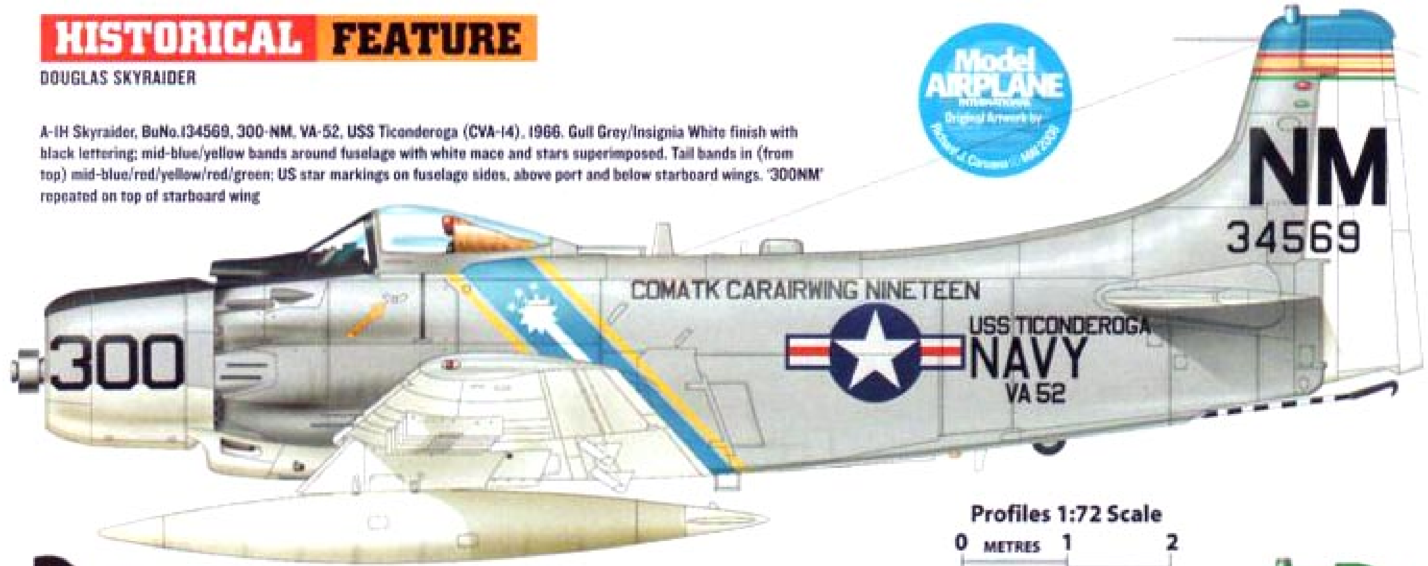


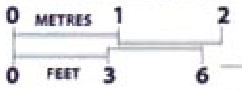
AD-6 Skyraider, BuNo.137607, AF-400, VA-65 'Tigers', USS Intrepid (CVA-11), January 1961. Gull Grey/Insignia White finish with all lettering in black; orange rudder with white stars superimposed. Orange flash along fuselage, thinly outlined in white; standard US Navy and national markings



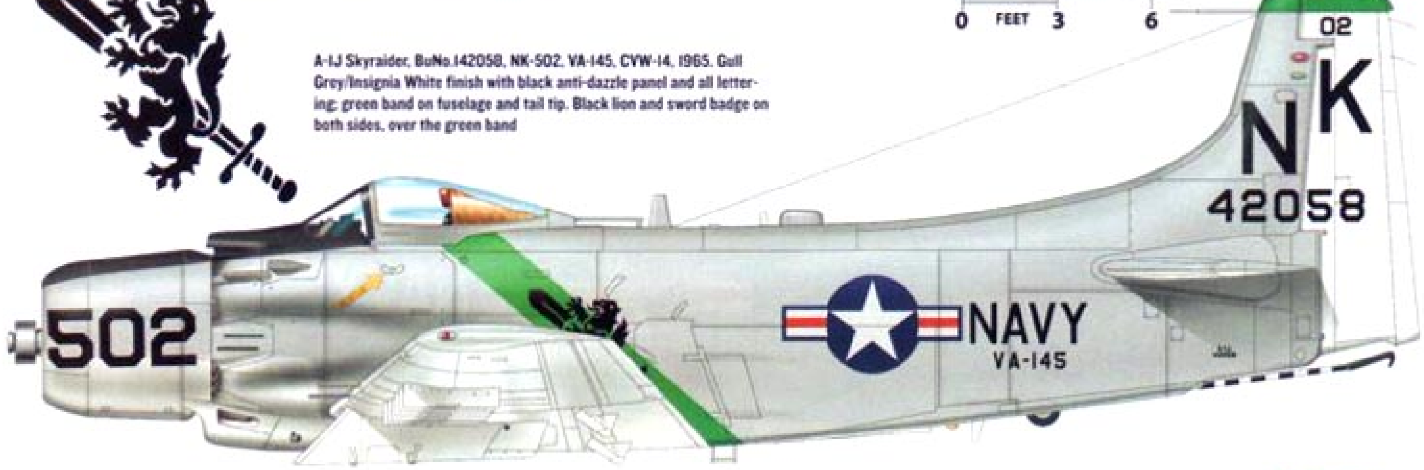
All the unique marking artwork for the profiles on this page are available to download from our website [www.modelairplaneinternational.com] so that you can produce these options as decals using the numerous ink jet printer compatible decal paper now available

A-1H Skyraider, BuNo.134569, 300-NM, VA-52, USS Ticonderoga (CVA-14), 1966. Gull Grey/Insignia White finish with black lettering; mid-blue/yellow bands around fuselage with white mace and stars superimposed. Tail bands in (from top) mid-blue/red/yellow/red/green; US star markings on fuselage sides, above port and below starboard wings. '300NM' repeated on top of starboard wing



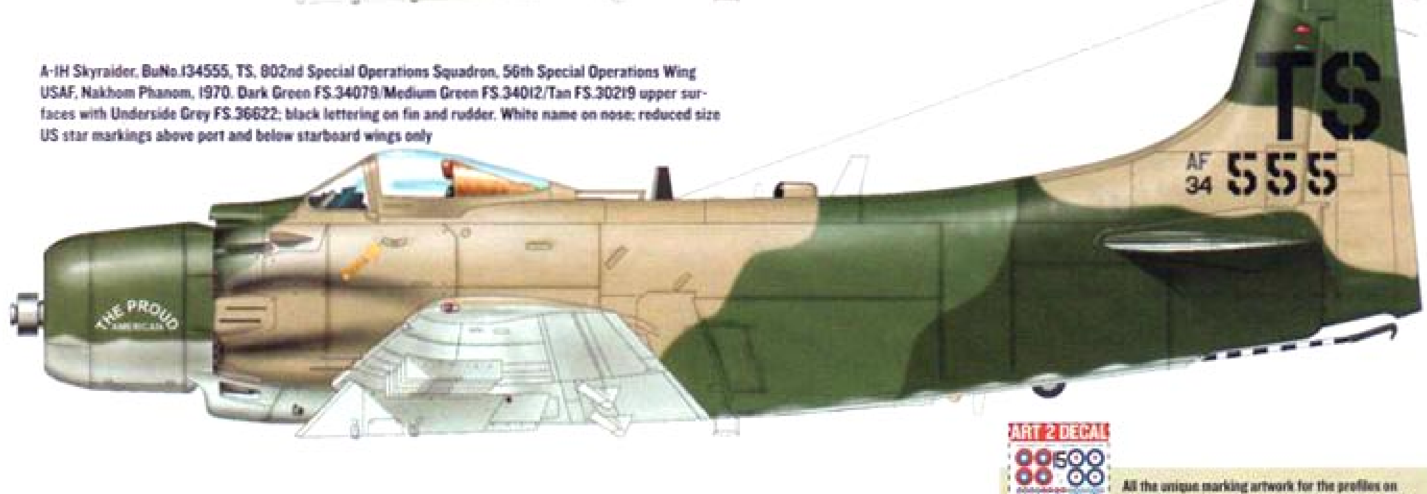


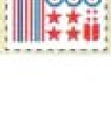
A-1J Skyraider, BuNo.142058, NK-502, VA-145, CVW-14, 1965. Gull Grey/Insignia White finish with black anti-dazzle panel and all lettering; green band on fuselage and tail tip. Black lion and sword badge on both sides, over the green band



A-1H Skyraider, BuNo.137543, AK/409, VA-176, USS Intrepid, 1966. Gull Grey/Insignia White finish with black anti-dazzle panel, all lettering and 20 mission markings under the cockpit; 'Bumble Bee' marking in yellow and black over a red flash. Orange fin/rudder tip and 'E', shadowed in black, on fuselage; standard Navy and national markings; MiG kill marking below cockpit in black and red

A-1H Skyraider, BuNo.134555, TS, 602nd Special Operations Squadron, 56th Special Operations Wing USAF, Nakhom Phanom, 1970. Dark Green FS.34079/Medium Green FS.34102/Tan FS.30219 upper surfaces with Underside Grey FS.36622; black lettering on fin and rudder. White name on nose; reduced size US star markings above port and below starboard wings only





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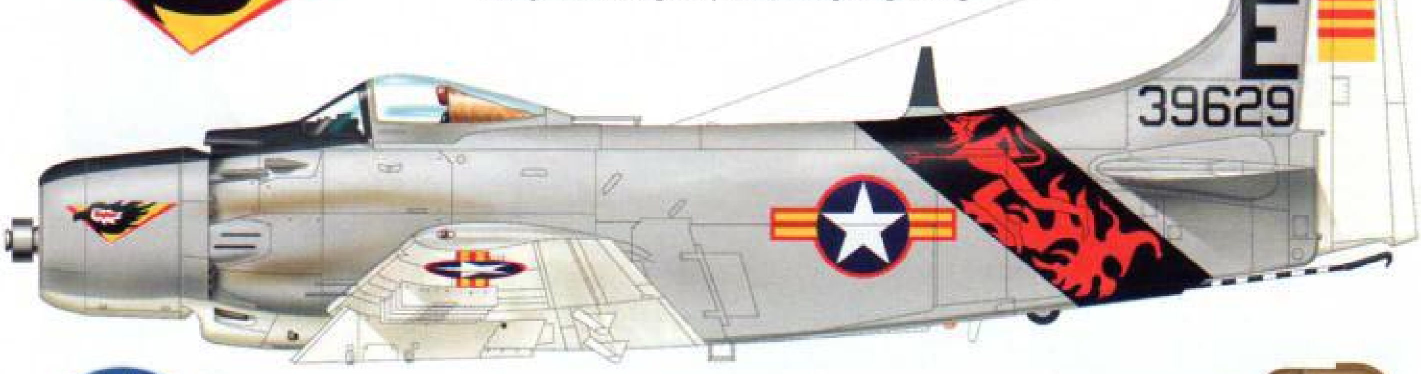
A-1H Skyraider, BuNo.139629, E, 'Satan Flight', No 514th Fighter Squadron, South Vietnamese Air Force, Bien Hoa, September 1962. Gull Grey/White finish with black anti-dazzle panel, code and serial; black band with red 'devil' on rear fuselage. National markings in six positions; unit badge on engine cowling



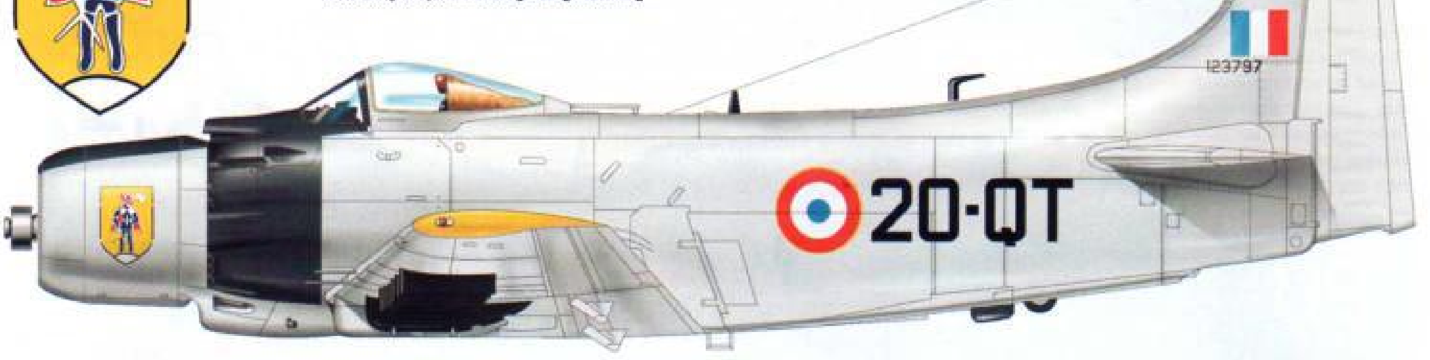
A-1H Skyraider, BuNo.139744, UC, of the 522nd Fighter Squadron, South Vietnamese Air Force operating in support of the 83rd Special Operations Group, November 1966. Distruptive pattern of dark brown and dark green uppersurfaces; white undersides. National markings in four wing positions; code and serial in black, the latter on the original Light Gull Grey background. The script on the nose is 'Cuu-Sach', meaning 'The Better'

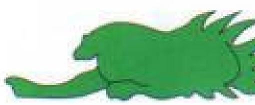
Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

AD-4 Skyraider, BuNo.123797, 20-QT, of Ec.2/20, Armee de d'Air, Algeria between 1962 and October 1975, when the unit was disbanded. Natural metal overall with black anti-dazzle panel and forward area of fuselage (aft of cowling gills); serial and codes in black. National markings, outlined in yellow, on fuselage sides and above wings only; unit marking on engine cowling





AD-4N Skyraider, BuNo.124143, FP, 1/22 Squadron (French Air Force), in Gabon, 1978. Natural metal overall with green trim in the form of flash along fuselage sides, wingtips and fin/rudder top; nose marking also in green. Black anti-dazzle panel, cowling front and front fuselage aft of cowling gills; blue/yellow/blue roundels, outlined in white, on fuselage sides only with fin flashes in same colours

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Skyraider AEW.I, WV178, 424Z/C, of No.849 Naval Air Squadron, HMS Albion, Suez Crisis, 1956. Sea Blue Gloss overall; yellow/black 'Suez' bands around rear fuselage and wings. White serial and codes; roundels in six positions

Skyraider AEW.I, WV179/432-V, 'B' Flight, No.849 Naval Air Squadron, HMS Victorious. Sea Blue Gloss overall with all lettering in white; roundels in six positions. Bee marking, within a white square, on engine cowling (both sides)

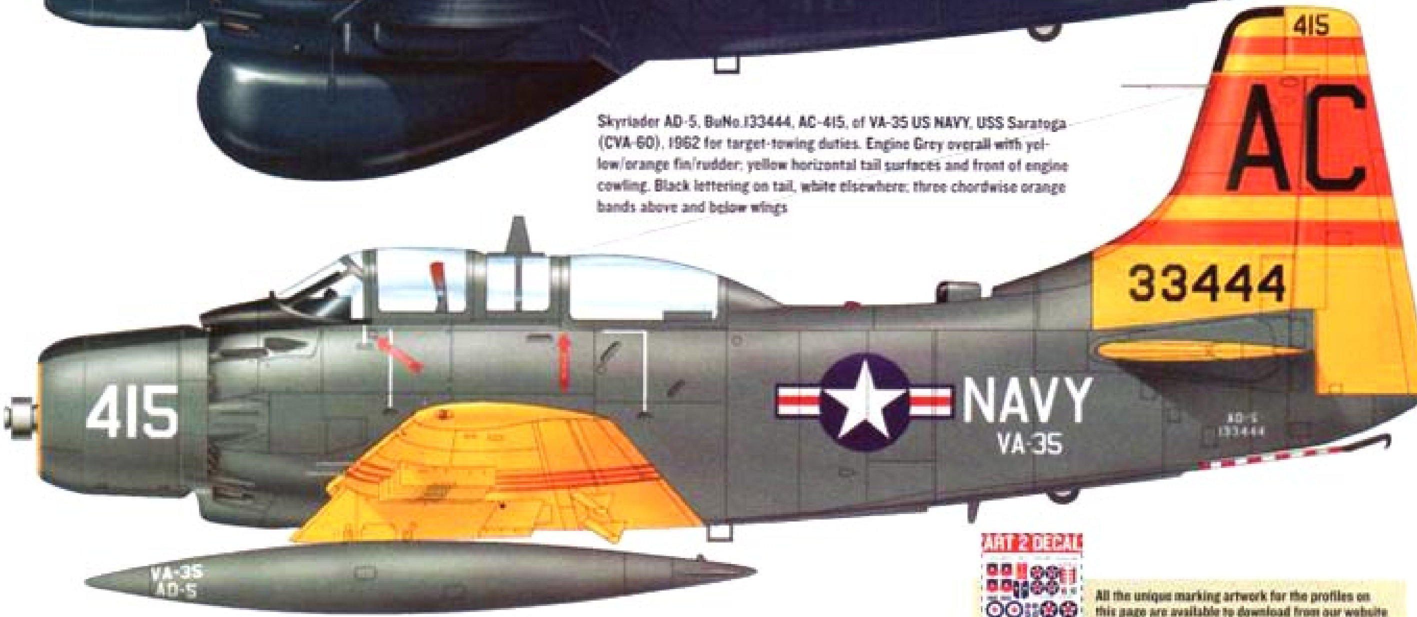
Profiles 1:72 Scale

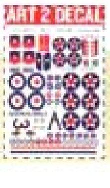
0 METRES 1 2

0 FEET 3 6

Skyraider AD-4W, BuNo.124083, 20-ND, CV-II US Navy, USS Boxer (CVA-21), August 1955. Sea Blue Gloss overall with all lettering in white; '20ND' repeated above starboard wing. US Star markings in red and white on fuselage sides, above port and below starboard wings; white top and bottom tips

Skyriader AD-5, BuNo.133444, AC-415, of VA-35 US NAVY, USS Saratoga (CVA-60), 1962 for target-towing duties. Engine Grey overall with yellow/orange fin/rudder; yellow horizontal tail surfaces and front of engine cowling. Black lettering on tail, white elsewhere; three chordwise orange bands above and below wings





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Lt Bui D. Giang's narrow escape after belly landing his A-1H (134585/Q) at Bien Hoa in 1966. He had suffered damage in his hydraulic equipment during a strike against North Vietnamese ground targets (RJ Caruana Archives)

led to improvement in other areas. These included the installation of a R-3350-26W engine that provided 3,020hp, fitted with a revised exhaust collector ring and stacks, a 'wet' pylon for an external fuel tank together with internal and external cockpit modifications. Speed increased by 18 knots while range was also marginally improved. All AD-2s (178) went to the Navy; a number of AD-1s were rebuilt to AD-2 standard to extend their operational life. Sub-versions consisted of the AD-2Q and the AD-2QU of which only one was built for target-towing.

AD-3

There were little external (or even internal) differences between the AD-2 and AD-3. A most important modification regarded the lengthening of the main undercarriage legs' stroke by 14 inches (36cm) to soften heavy carrier landings, while the tailwheel was made semi-retractable. A notch was cut into the bottom of the rudder to give the arrestor hook more clearance. AD-3s totalled 125, to which one has to add the sub-versions as follows: 23 AD-3Q; 31 AD-3W; 15 AD-3N and a pair of AD-3Es converted from AD-3Ws fitted with special electronic equipment.

AD-4

Main improvements centred around the installation of a new APS/19A radar which radically changed the main instrument panel layout, and also the inclusion of an AP-1 auto-pilot. The armoured windscreen was widened, and as from the 210th production machine an additional 20mm cannon (retrofitted to most of the previous production examples) was added to each wing. The Wright R-3350-24WA now offered 3,020hp, enabling the AD-4 to reach a top speed of 315 knots. The outbreak of the Korean War pushed production of this version up to 1,015 of which the following were sub-variants: 63 AD-4L (winterised with de-icing boots on leading edges of wings, elevators and fin); 165 AD-4B (capable of carrying nuclear ordnance); 39 AD-4Q; 307 AD-4N (some modified to NL – winterised versions and NA – Day Attack); 168 AD-4W.

AD-5 [A-1E]

This was a radical departure from the standard AD Skyraider, with a widened and lengthened fuselage intended for the attack bomber role. Moving the R-3350-26W slightly forward required an extension to the aft fuselage to compensate its weight for centre of gravity purposes. The cockpit accommodated two crew members sitting side by side, while the fin and rudder area was completely redesigned and enlarged in area by some 50 percent. The first of 212 AD-5s made its maiden flight on 17 August 1951 and apart from being used by the Navy, some examples were also acquired by the US Air Force (Tactical Air Command) for COIN (COunter-INsurgence) operations in Vietnam, while a smaller number were delivered to the Vietnamese Air Force. In 1962 the US Navy again revised its designation system and the AD-5 became the A-1E. From now on, in this narrative, the revised designations will be carried in [parenthesis]. Sub-versions included the AD-5N [A-1G] of which 239 were produced, 218 AD-5W [EA-1E], 54 AD-5Q [EA-1F] and a single AD-5S which was a prototype for Anti-Submarine Warfare (ASW). Such was the versatility of the AD-5Q that Douglas designed numerous kits that could be fitted on the field and it became known as the 'Twelve-in-OneRaider'!

AD-6 [A-1H]

'Able-Dog Six' was basically a redefined AD-4B, generally strengthened, carrying simplified electronics and providing its pilot with side armour-plating. Powered by the Wright R-3350-26WD, it could attain a top speed of 258 knots with an improved range of 1,143 nautical miles. 713 examples were built, this time without sub-variants, and it became one of the most widely used Skyraider versions, having been flown by the US Navy, US Marines and US Air Force. A number of this version was also supplied to the Vietnamese Air Force during the late 1960s.

AD-7 [A-1J]

The only difference to the earlier AD-6 consisted of the installation of the more powerful Wright R-3350-26WB, which gave the AD-7 a top speed of 285 knots. Further strengthening went into the wings and undercarriage. Special kits were designed so that the AD-7 could be converted into an air-to-air tanker. This was so successful that similar kits were also supplied and fitted to the earlier AD-6. Of the original 240 examples of this version on order for the US Navy, only 72 were eventually produced and when Bu. No. 142081, the last Skyraider, rolled out on 18 February 1957, the era of the piston-engined bomber specifically designed for the US Navy came to an end, with a grand total of 3,180 Skyraiders built.

A development radically different in powerplant from the standard engine installation was the production of six A2D-1s powered by the Allison T-40 turboprop turning a pair of contra-rotating propellers. Named 'Skyshark', the projected aircraft was hampered by extensive engine development difficulties, especially where the twin-prop reduction gear was concerned, and development was terminated when the prototypes were struck off charge in February 1954.

IN ACTION

Built in the immediate post-World War II era, the Skyraider was destined to see action in two subsequent conflicts. AD-4s from Attack Squadron (VA) 55 were launched from USS Valley Forge for their first operational attacks against airfields and installations around Pyongyang on 3 July 1950, marking the type's debut in the Korean War. Other 'Spad' (as the AD was also known) units in this theatre included VA-115 operating from USS Philippine Sea, VA-35 from the Leyte and VA-65 on board USS Boxer. These were later joined by VA-159, VA-923, and VA-702; the latter in particular was a major protagonist of the attacks on the 'Bridges at Toko-Ri' (which inspired a movie of the same name).

Night attack duties were assigned to the AD-4Ns of VC-35 usually armed with one 500lb bomb, six 250lb bombs and six flares. Marine units involved in this conflict included VMC-1 mainly flying the AD-4Q. Regarded as the most successful aircraft of the three-year conflict for the precision with which it could deliver its ordnance, it carved a unique niche for operational capabilities that could not be performed by any other aircraft.

This success did not go unnoticed, and the first exports went to the Royal Navy in the form of 36 AD-4Ws, which in British service were redesignated AEW-1. At first these 'pregnant' Skyraiders were delivered to No. 778 Naval Air Squadron (NAS) of the Fleet Air Arm for operations training but eventually they were formed into No 849 NAS and some of them were to see action during the Suez Crisis. Skyraiders of 'C' Flight were assigned to HMS Albion while those of 'A' Flight operated from HMS Eagle. At the end of their career with the RN in 1962 most of the survivors were acquired by Swedish Air Services Ltd, which provided target-towing duties to the Swedish Air Force. Removal of the belly radar and auxiliary tail stabilisers and installation of target towing equipment was undertaken by Scottish Aviation Ltd.

As from late 1959, 113 AD-4s were delivered from ex-US Navy stocks to France for operations in Algeria with EC.20 and later distributed among EAA.21 and EAA.22. In 1964 a small number were ceded to Cambodia and in 1975 others were provided to Chad. A few surviving French Skyraiders were finally disposed of in 1977, mainly to private collectors in the US.

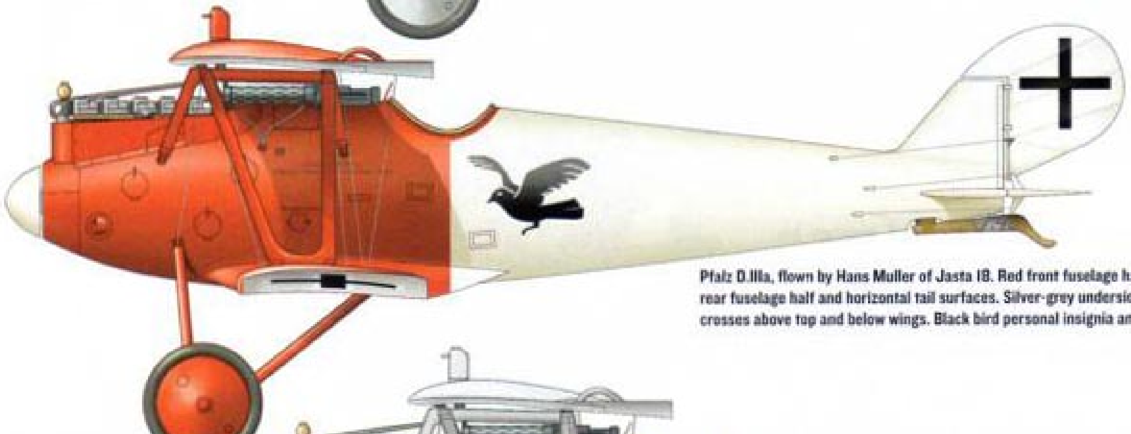
Skyraider operations in Vietnam would require entire volumes, and space here would not do justice to its brilliant career on this front, which started in June of 1964. Patrols turned into action two months later when Carrier Group Five's 'Able-Dogs' went into action. This theatre highlighted the abilities of the wide-bodied AD-5 [A-1E], especially at the able hands of the pilots flying within the Special Operations Squadron of the US Air Force. Much less publicised was the use of the Skyraider by the Vietnamese Air Force, which carried some of the most colourful markings on this type.

Call it 'Spad', 'Able-Dog' or just plain 'Skyraider' – it's the one and only AD, the true workhorse of the US Navy, and others, for more than thirty years. For most of its life it carried on with its duties unsung, but certainly not unnoticed. For, wherever it went into combat, it delivered with a precision that speaks volumes of its ability, and that of its crews who pushed through their attacks knowing full well that it could be trusted to take more than it could give. Though that is the most desirable quality in an attack aircraft, few such aircraft can lay a claim to equal the Skyraider's fame and fortune. ■

AEW.1s WT961, WT952, WT957 and WT960 of B Flight, 849 Squadron flying from HMS Ark Royal. Of these, 952 and 957 were eventually sold to Sweden after conversion for target-tug duties (RJ Caruana Archives)

Pfalz D.IIIa, 8304/17. Silver overall with light-coloured lozenge fabric underside of wings and darker tones for the uppersurfaces and movable elevator; personal marking on both sides of fuselage

Pfalz D.III, 4011/17/H, flown by Lt Fritz Hohn, Jasta 21, winter 1917-18. Silver overall with black/white bands aft of cockpit and black strips around front fuselage; red criss-cross bands around fuselage and tail unit. National markings in black only, except on rudder; all other markings in black

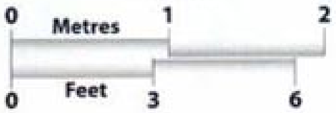


Pfalz D.IIIa, flown by Hans Muller of Jasta 18. Red front fuselage half and top of both wings; white rear fuselage half and horizontal tail surfaces. Silver-grey undersides of wings; plain black/white crosses above top and below wings. Black bird personal insignia and rudder cross

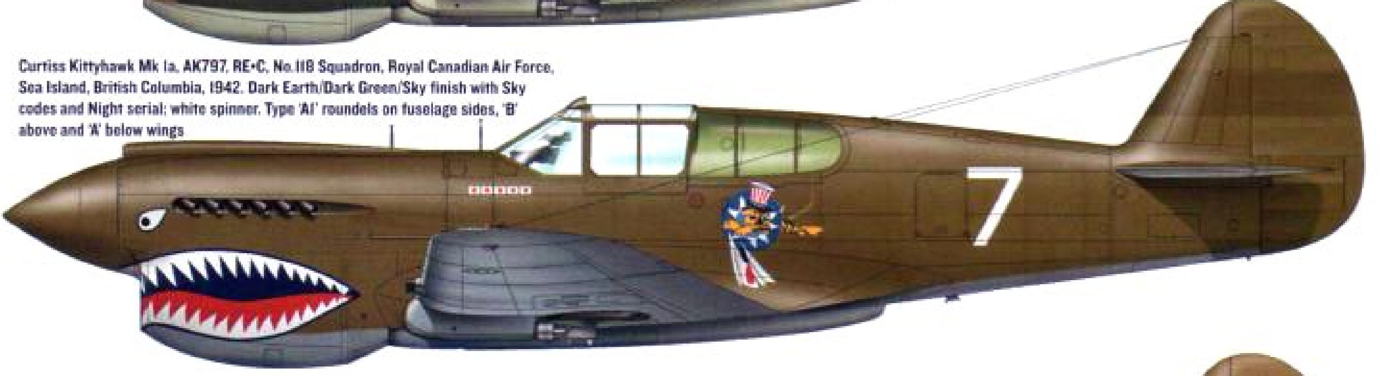
Pfalz D.IIIa, flown by Max Holtzem, Jasta 16, early 1918. Silver-grey overall; black trim including all black tail unit. Black spinner and black/white comet on fuselage sides. Eight-pointed star in black above top wing

Pfalz D.IIIa, flown by Hptm. Rudolf Berthold, commanding JG.2, May 1918. Red front half of fuselage, and blue aft including tail unit; blue uppersurfaces of wings. White personal marking on both sides of fuselage; national markings black, outlined in white

PROFILES
1:48 Scale



Curtiss Kittyhawk Mk Ia, AK797, RE•C, No.118 Squadron, Royal Canadian Air Force, Sea Island, British Columbia, 1942. Dark Earth/Dark Green/Sky finish with Sky codes and Night serial; white spinner. Type 'A1' roundels on fuselage sides, 'B' above and 'A' below wings



Curtiss P-40E, 'White 7' flown by Colonel Robert L. Scott, 23rd Fighter Group, 14th Air Force, USAAF, Burma, 1942. Olive Drab upper surfaces with Neutral Grey undersides; standard USAAF markings on wings. Blue/red/white 'sharkmouth' around nose; white '7' on fuselage sides

P-40E, 'White 50', flown by Maj. Petr A. Pokryshev, 154th IAP, Leningrad, Summer 1942. Dark Earth/Dark Green/Sky finish with white spinner and code on fuselage sides; red star markings in six positions. Star victory markings in yellow and red, outlined in white, aft of cockpit

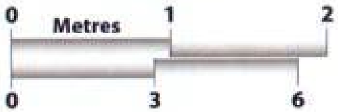
Scrap view above shows typical upper surface pattern in Dark Earth/Dark Green, and position of markings for RCAF example at top of page

Above & Below: P-40E, 'Yellow 96', flown by Lt Col. John S. Chennault of the 11th FS, 343rd FG, 11th AF, USAAF, Fort Glenn, Aleutian Island, late 1942. Olive Drab/Neutral Grey finish with spinner and serial on fin in yellow. Underside markings consist of 'U.S.' in black below starboard wing, and 'ARMY' below port. White angled band around fuselage and another vertical white band on rudder

Model Airplane International
Original Artwork by Richard J. Caruana © MAI 2008

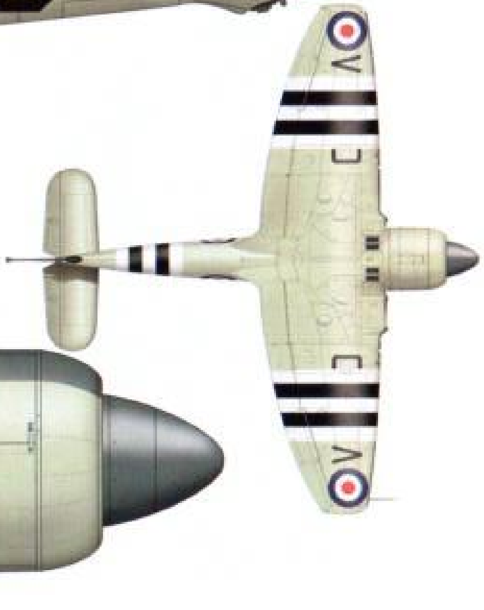
Sea Fury FB.II, VW225/117, No.871 Squadron, Royal Canadian Navy, 1953. Extra Dark Sea Grey upper surfaces with Light Sea Grey undersides; all lettering in black. Blue/white roundels with red maple leaf in six positions; 'NAVY' in black below starboard wing, '117' below port in black. Red/white spinner; red flash on underwing fuel tank

PROFILES
1:48 Scale



Sea Fury FB.II, 6-38/860, No.860 Squadron, Royal Dutch Navy, HrMs Karel Doorman. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Orange cowling and spinner; national markings in six positions

Sea Fury FB.II, VX730/109/K, No.805 Squadron Royal Australian Navy, HMAS Sydney, Korea, 1951. Extra Dark Sea Grey upper surfaces with Sky undersides; black lettering. Black/white bands around wings and rear fuselage; roundels in six positions



1:1 REFERENCE

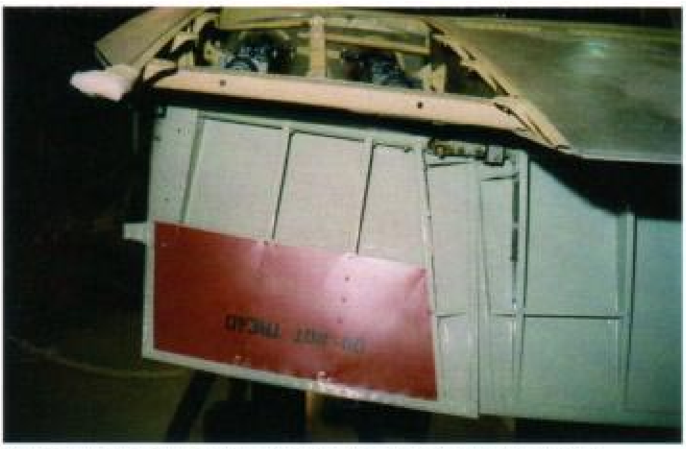
The following photographs depict the Sea Fury FB Mk II with The Fighter Collection at Duxford. This aircraft is being restored to flying condition and, we believe, is original even including the hydraulic system

All photos ©Richard A. Franks

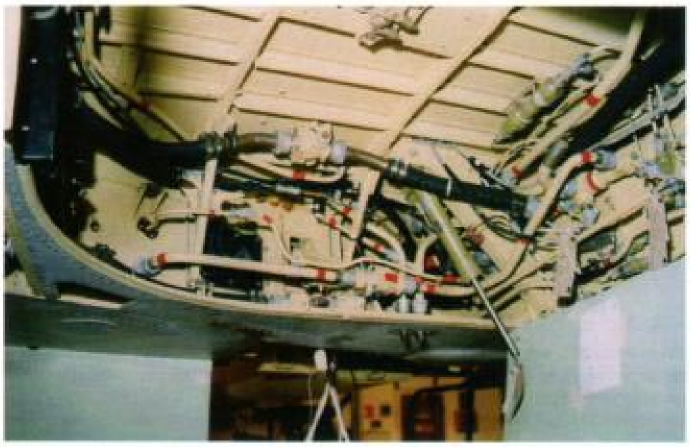
This is the forward section of the inner wing fold area on the port wing

The starboard oleo leg and hub

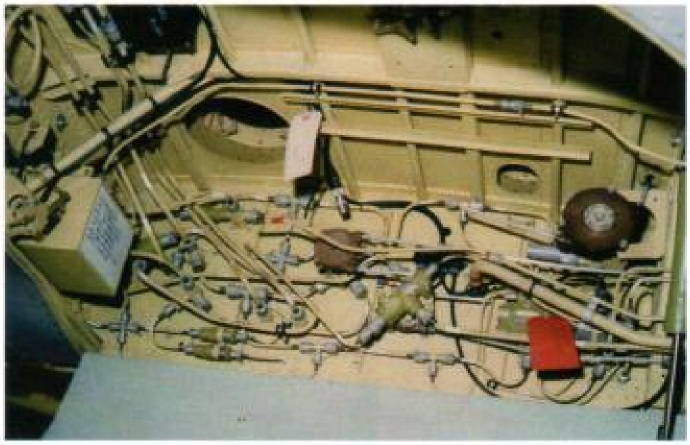
Looking up into the tailwheel bay



This is the outer section of the port flap, which you can see is directly behind the cannon bay

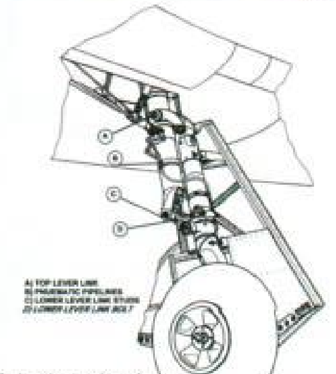


This is the starboard wheel well, looking aft



This is the starboard wheel well, looking outboard

This is the inboard section of the flaps on the port wing

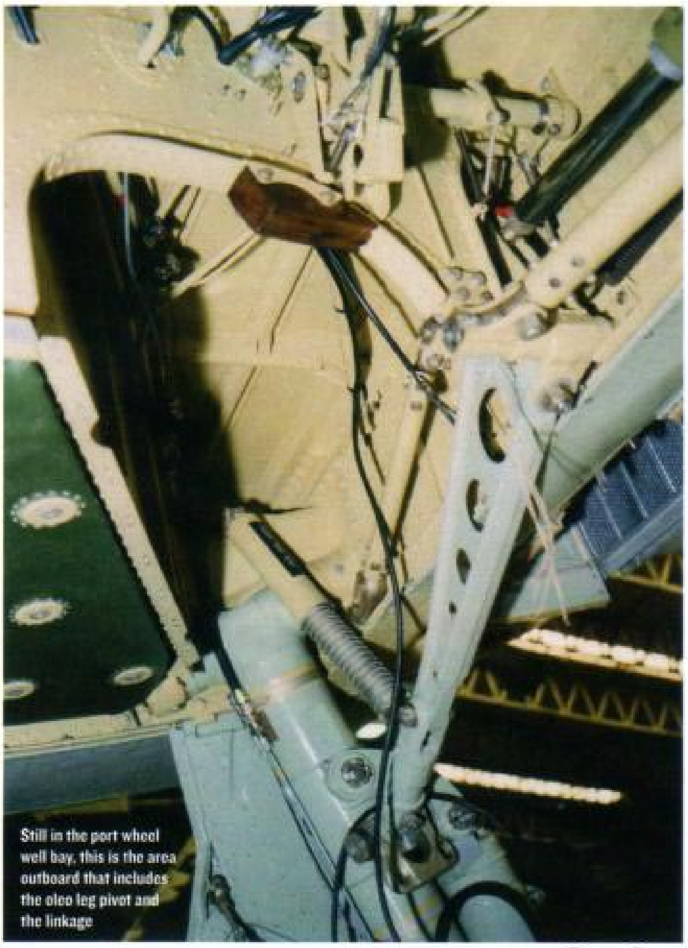


A nice diagram from the flight manual showing the main oleo leg and undercarriage door ©Crown Copyright

Crown Copyright used with the permission of HMSO

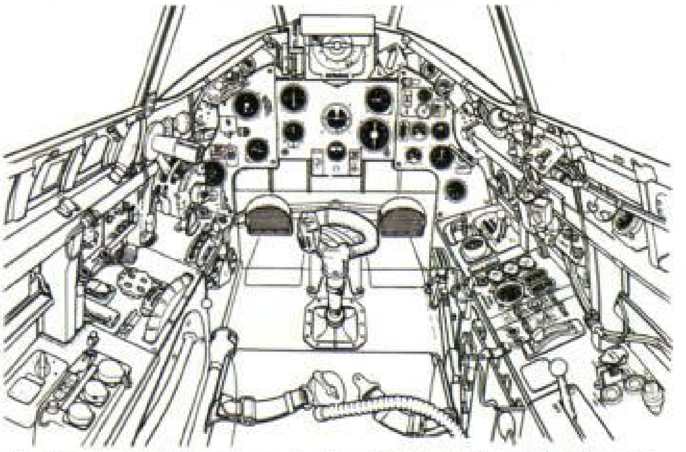
This is the aft section of the inner wing fold area on the port wing

This is the starboard cannon bay, viewed from the rear with the upper and lower panels removed

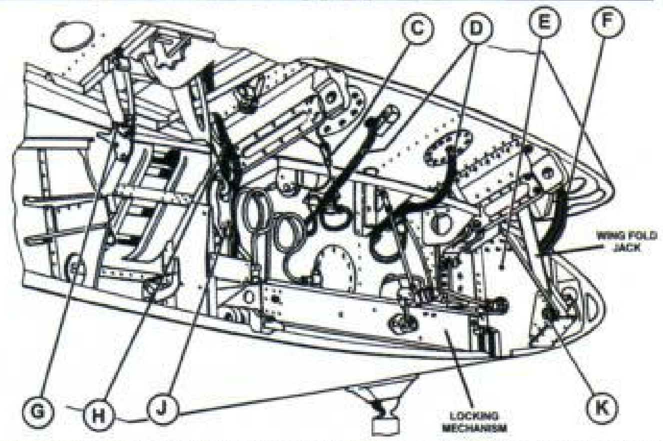


Still in the port wheel well bay, this is the area outboard that includes the oleo leg pivot and the linkage

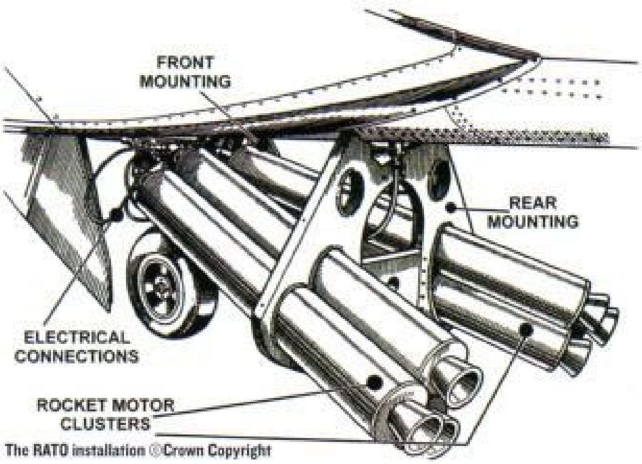
The port wheel well, looking aft



This diagram from the flight manual shows the standard FB Mk II cockpit layout ©Crown Copyright



This is another diagram from the flight manual, showing the wing fold for the starboard wing ©Crown Copyright

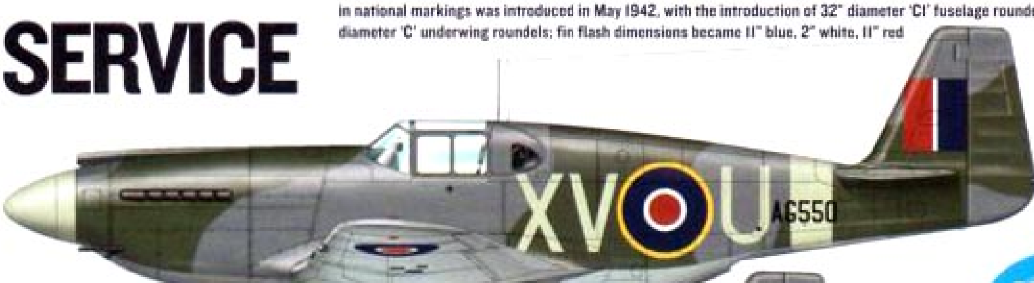


The RATO installation ©Crown Copyright

RAF/RCAF SERVICE

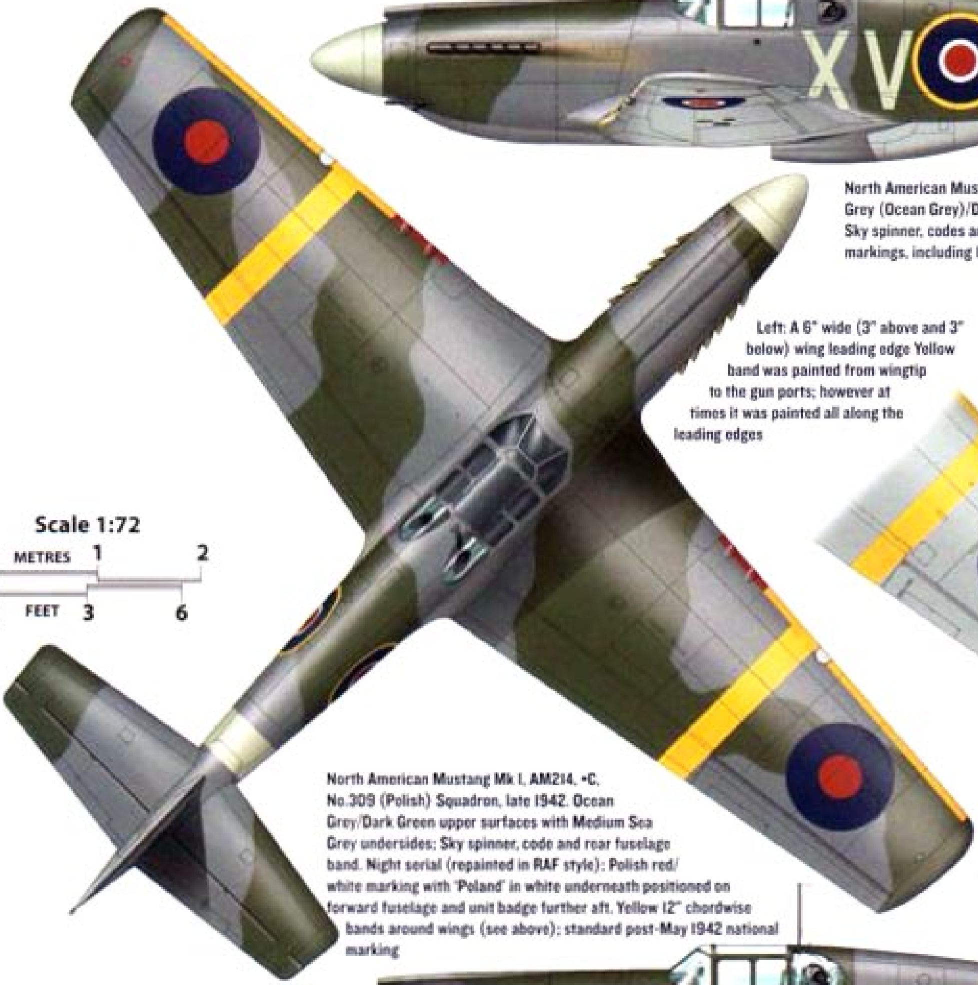
North American Mustang Mk I, AG550, XV•U, No.2 Squadron, July 1942. With few exceptions as illustrated on page 42, Mustangs were usually repainted before delivery to the units in Mixed Grey/Dark Green on the upper surfaces and Medium Sea Grey on the undersides; Sky spinner, codes and rear fuselage band (the latter appears to be slightly narrower than standard). Night serial, code 'U' repeated reversed out of a white disc below nose. A change in national markings was introduced in May 1942, with the introduction of 32" diameter 'C1' fuselage roundels, 32" diameter 'C' underwing roundels; fin flash dimensions became 11" blue, 2" white, 11" red

Scrap view of individual code 'U' reversed out of a white disc below the nose of AG550



North American Mustang Mk I, AP247, •A, No.4 Squadron, RAF Clifton, late 1942. Standard finish with sky spinner, code and rear fuselage band. Night serial in 6" high letters positioned high on the Sky fuselage band; standard post-May 1942 national markings

North American Mustang Mk I, AL995, XV•S, No. 2 Squadron, July 1942. Mixed Grey (Ocean Grey)/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, codes and rear fuselage band. Night serial; post-May 1942 national markings, including 12" wide Yellow wing leading edge band (full span length)



Left: A 6" wide (3" above and 3" below) wing leading edge Yellow band was painted from wingtip to the gun ports; however at times it was painted all along the leading edges

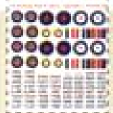
Left: Being a new type, and one that could be mistake for a Bf 109, the Mustang was given quick recognition markings in the form of 12" wide chordwise bands, above and below wings. This was a short-lived measure, introduced in July 1942, which was discontinued as from December of th same year

Scale 1:72
0 METRES 1 2
0 FEET 3 6

North American Mustang Mk I, AM214, •C, No.309 (Polish) Squadron, late 1942. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial (repainted in RAF style); Polish red/white marking with 'Poland' in white underneath positioned on forward fuselage and unit badge further aft. Yellow 12" chordwise bands around wings (see above); standard post-May 1942 national marking

North American Mustang Mk I, AL967, •L, No.169 Squadron, RAF Doncaster, October 1942. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial (repainted in RAF style); standard post-May 1942 national markings. Yellow chordwise 12" band above and below wings

ART 2 DECAL



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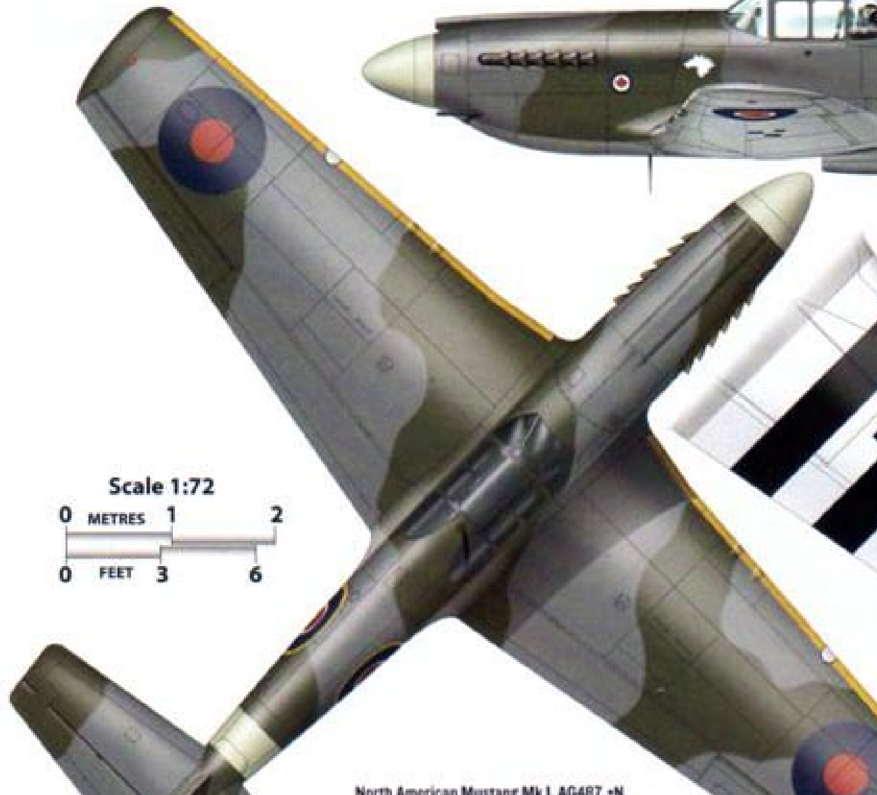
North American Mustang Mk I, AG512, RZ•A, No.168 Squadron, taken over from No.241 Squadron and still bearing its codes, February 1943. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, codes and rear fuselage band. Night serial (repainted in non-standard style); standard post-May 1942 national markings

Left: North American Mustang Mk I, AM244, •Z, flown by Maj. Jerzy Golko, No.309 (Polish) Squadron, RAF Kirknewton, March 1943. It is believed that this aircraft was repainted on the upper surfaces in a lighter than usual shade of the specified Mixed Grey while the Dark Green appears patchy and some panels appear to have been replaced with those from another aircraft; undersides in Medium Sea Grey. Sky spinner, code and rear fuselage band; Night serial. Standard post-May 1942 national markings; Polish badge on nose

North American Mustang Mk I, AM251, •O, No.414 Squadron RCAF, Dunsfold, June 1943. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial (repainted in RAF style); red Maple Leaf on a white disc, outlined in blue, on forward fuselage and a white horse's head further aft. Standard post-May 1942 national markings



Left: Since it was believed that the Night/white stripes above the wings and on the upper part of the fuselage would compromise the Mustang's camouflage when flying at low level, these were only applied to the undersides

North American Mustang Mk I, AG487, •N, No.168 Squadron, Sommervieu (France), June 1944. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. 18" wide Night/white bands around fuselage and below wings only; Night serial repositioned below tailplane

ART 2 DECAL

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North American Mustang Mk I, AL971, SP•S, No.400 Squadron RCAF, Middle Wallop, October 1942. It would appear that the aircraft's colour scheme had been toned down for night operations with the overpainting of most of the forward fuselage, presumably in Dark Green over the previous Mixed Grey/Dark Green, while the undersides were washed in black or Night. Sky spinner, codes and rear fuselage band; Night serial. Yellow chordwise band above the wings; standard post-May 1942 national markings

North American Mustang Mk I, AM148, RM•G, No.26 Squadron, August 1942. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, codes and rear fuselage band. Night serial; standard post May 1942 national markings

Below: North American Mustand Mk I, AG431, •D, No.16 Squadron, early 1943. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial; standard post-May 1942 national markings

North American Mustang Mk I, AG367, X•63, Advanced Training Flight, No.41 Operational Training Unit, RAF Hawarden, 1943. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides. Sky spinner and rear fuselage band; Yellow codes. Night serial; standard post-May 1942 national markings. References credit this aircraft as serving with an RCAF OTU formed from No.400 Squadron but no record to back this claim has been found.

Right: North American Mustang Mk I, AL986, •P, 'Lazy Lady', No.430 Squadron RCAF, Eindhoven, 28 October 1944. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night/white 18" wide stripes below rear fuselage and wings only; Night serial (repainted in RAF style). Standard post-May 1942 national markings; name 'Lazy Lady' in yellow on nose on what appears to be a replacement panel

North American Mustang Mk Ia, FD544, •V, No.170 Squadron, RAF Hutton Cranswick, late summer 1943. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial (repainted in RAF style and repositioned below tailplane); standard post-May 1942 national markings

North American Mustang Mk Ia, FD483, •H, No.170 Squadron, September 1943. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial; standard post-May 1942 national markings. Note Yellow wing leading edge markings extend all the way to the wing root

North American Mustang Mk II, FR919, •N, No.2 Squadron,Beny-sur-Mer (France), August 1944. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night/white 18" wide bands below rear fuselage and wings only; Night serial (repainted in RAF style). Standard post-May 1942 national markings

No. 268 Squadron and the Allison-engined Mustang

No.268 Squadron received its first Mustang Mk I aircraft on April 18, 1942 (ten aircraft picked up from RAF Speke and flown back to their base at the time RAF Snailwell near Newmarket in southern England).

Following a period of familiarisation with the new aircraft, as well as rectification of a range of emerging problems, their first operational sortie was flown on June 29, 1942, being a 'Jim Crow' shipping reconnaissance off the Dutch Coast flown by the Squadron Commanding Officer and one of his experienced Flight Commanders.

June 29, 1942 offensive operation 'Jim Crow' comprising two Mustangs flown by Wg Cdr Anderson DFC in AG529 and Flt Lt Clapin in AG466, being a shipping reconnaissance off the Dutch Coast between Ijmuiden and Texel, this being the Squadron's first operational sortie with the Mustang. The aircraft took off from Snailwell at 1540 hrs, crossing the coast south of Great Yarmouth at 1555 hrs. They flew out on a course of 102 degrees for 35 minutes, then turned onto a course of 20 degrees for 10 minutes, and then onto a course of 266 degrees for a further 35 minutes, recrossing the English coast at 1715 hrs and returning to Snailwell at 1730 hrs. Seven fishing boats were seen at 4 degrees 30 minutes East 52 degrees 32 minutes North, off the Dutch Coast between Alkmaar and Bevewijk. Weather was fine with patches of mist and much haze. Cloud bank 50 feet thick at 1500 to 2000 ft over the north east of the area. The sortie was largely uneventful given the lack of sightings of any enemy shipping of importance or enemy aircraft.

After that first sortie, the pace of operations built up quickly so that on any given day a number of 'pairs' of Mustangs would be operational off the Dutch Coast on shipping reconnaissance sorties, reporting increasing amount of enemy shipping. The Squadron suffered its first operational Mustang losses on July 29, 1942 when two aircraft on a shipping reconnaissance off the Dutch Coast were 'bounced' and shot down by Fw 190s of II/JG1

North American Mustang Mk I, AM137, NM•H joined No.268 Squadron on July 25, 1942. Flew 27 operational sorties until October 23, 1942 when it was flown off for repairs to damage to one wing. It returned in early December and flew an additional seven operational sorties until the end of the year. Regularly used by a number of pilots, but was mostly flown by Fg Off. O.R. Chapman RNZAF. Was used by him on the Den Helder bomber escort in September 1942 and a number of other notable sorties. AM137 was flown by a number of the senior pilots in the Squadron, and seemed to be a 'favoured aircraft' for Flight Commanders. Heavily used early 1943 during Exercise 'Spartan', and flew another five operational sorties up until April 12, 1943 when it flew its last operational sortie with the Squadron. Passed to No.168 Squadron and flew until it was shot down by flak near Caen in France on August 3, 1944. Amongst other No.268 Sqn notables who flew this aircraft was Plt Off. R.A. Bethell, who was shot down in late 1942 and was made a PoW. In March 1943 he participated in 'The Great Escape' from Stalag Luft III at Sagan, one of the few recaptured prisoners who was not executed by the Gestapo for his part in the escape

Above: North American Mustang Mk I, AG416, NM•E, No.268 Squadron, RAF Snailwell, late 1942. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, codes and rear fuselage band. Night serial; standard post-May 1942 national markings

Bottom: North American Mustang Mk I, AG563, •S, flown by Fg Off. J. Irwin, RCAF, No.268 Squadron, 7 July 1943. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial; standard post-May 1942 national markings. Note aircraft presented a highly stained forward fuselage

AG563 flown by Fg Off. J. Irwin RCAF, came from No.225 Sqn, went to No.613 Sqn, then to No.63 Sqn. Came to No.268 in March 1943 and participated in Exercise 'Spartan'. Flew 10 operational sorties with No.268 Sqn, before being passed to No.613 when No.268 Sqn started to receive Mustang Mk Ia aircraft in July-August 1943. When photographed, was just at the point where No.268 Squadron was retiring its Mustang Mk I aircraft and introducing the Mustang Mk Ia aircraft into service and flew one of the last operational sorties flown by squadron using Mustang Mk I aircraft. Heavily used aircraft. Note variation in placement of squadron ID letter while serial retains its original position and the Sky band was probably painted around it

While the detail at far left shows the position of the 18" wide D-Day ID bands below the starboard wing, the view above shows the way the yellow wing leading edge at times extended all the way from wingtip to wing root

Scale 1:72
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AM104, •L is a Mustang with a long and distinguished career with the RAF. It served with No.268 Squadron in May through August 1943, originally having served with No.400 Squadron RCAF before being sent to No.268 Sqn. July 12, 1943 hit by 20mm HE flak near Vascoeuil, France, made it safely back to base at RAF Odiham despite significant damage to the tail area, including the rudder and elevator control cables. Sent for repairs at a Maintenance Unit and served briefly with No.268 Squadron in August 1943, before going on to serve with No.414 Sqn RCAF and then with No.430 Sqn RCAF until October 1944 when it was retired after receiving severe flak damage over Venlo in the Netherlands.

At the time of being damaged on July 12, 1943, it was being flown by Fg Off. A.R. 'Dick' Hill (awarded the Distinguished Flying Cross four days later).

Below: North American Mustang Mk Ia, FD535, •X, No.268 Squadron, early 1945. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Night spinner and serial. Sky code; 'CI' type roundels in all positions, with those above wings consisting of the original 'B' type to which an outer yellow outline and an inner white band added

Below: North American Mustang Mk Ia, FD546, •G, No.268 Squadron, Operation Starkey, September 1943. Standard finish and markings, except for Night/white bands below outer wing section applied for this particular operation

Above: North American Mustang Mk Ia, FD535, •X, No.268 Squadron, early 1945. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Night spinner and serial. Sky code; 'CI' type roundels in all positions, with those above wings consisting of the original 'B' type to which an outer yellow outline and an inner white band added

We are grateful for the assitance and material provided by Colin Ford, No.268 Squadron RAF Historian, for the preparation of this feature and especially for checking all the illustrations presented on these two pages

Above: North American Mustang Mk II, FR915, •L, flown by Sqn Ldr A.S. Mann (D.F.C.), C.O., No.268 Squadron, November 1944. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, code and rear fuselage band. Night serial; standard post-May 1942 national markings

FR915/L – the jewel in the crown of No.268 Squadron's Mustang Mk II aircraft. Was the Commanding Officer's regular aircraft from November 1944 until April 1945. Was flown by both Sqn Ldr A.S. Mann (D.F.C.) and Sqn Ldr C.T.P. Stephenson (DFC and Bar). A unique aircraft in that it could carry up to five cameras (two oblique to port, two oblique to starboard and one vertical) and was fitted with a Malcolm Hood. Was transferred to No.268 Sqn from No.2 Sqn in early November 1944 and flew its first operational sortie with the Squadron on December 6, 1944, flying a total of six operational sorties before the end of 1944. It flew a further 45+ operational sorties in the time from January 1, 1945 until VE Day. It was flown back from Europe to the UK in July 1945 for disposal. Note the camera installation behind the cockpit, and also the rear fuselage camera installation with the lens visible in the forward edge of the roundel. The vertical lens guard/hood is seen just in front of the tail wheel, in line with the rear edge of the second underfuselage white ID stripe. The yellow wing leading edge strip on each wing extended from the wingtip to the last panel line before the panel containing the wing mounted .50 HMGs. Post February 1945, this aircraft would have had its camouflage and markings modified to comply with the latest 2nd TAF directives, so would have had the underside black/white identification stripes removed, the spinner painted black, roundels converted to type 'CI' at all locations, and the Sky rear fuselage band removed

Right: North American Mustang Mk II, FR908, •S, No.268 Squadron, 1945. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Night spinner and serial. Sky code; 'CI' roundels on fuselage sides and below wings while the 'B' type roundels above the wings were also modified to 'CI'. Note that this example was fitted with a Malcolm Hood

Left: North American Mustang Mk II, FR918, •U, No.268 Squadron RAF, 1945. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Night spinner and serial. Sky code; 'CI' roundels on fuselage sides and below wings while the 'B' type roundels above the wings were also modified to 'CI'

Scale 1:72

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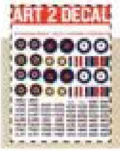
ART 2 DECAL



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Arado Ar 234B-2, W/Nr.140151, T9+KH, flown by Oblt. Werner Muffey, Kommando Sperling, November 1944. RLM 70/71/76 finish with white national markings on fuselage, fin and upper surfaces of wings. Code is white (T9) and black (KH)

PROFILES
1:48 Scale

Arado Ar 234B-2, F1+AD, flown by Maj. Hans-Georg Bätcher, commander of III./KG 76, early 1945. RLM 81/82/76 scheme with Hellgrün 25 trim to engine air intakes and 'A' of fuselage code, repeated just aft of the canopy glazing

Arado Ar 234B-2, W/Nr.140149, 4U+DH, of 1.(F)/123, flown by Hptm Hans Felde (Staffelkapitän), shot down on 11 February 1945. Originally in RLM81/82/76 with areas painted over either in a diluted white distemper or (as some sources claim) one of the lighter greys. Code '4U' and 'D' are in white; 'H' in black

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J Caruana © MAI 2008

1:1 REFERENCE

The following photographs depict the world's only surviving Ar 234B, which is part of the National Air & Space Museum and now on display at Dulles. These photos show the aircraft when dismantled and stored at the Paul E. Garber facility before its closure. My thanks, as always, to Scott for his help with these photos.

All photos ©Richard A. Franks

This is the nosewheel bay, looking forward

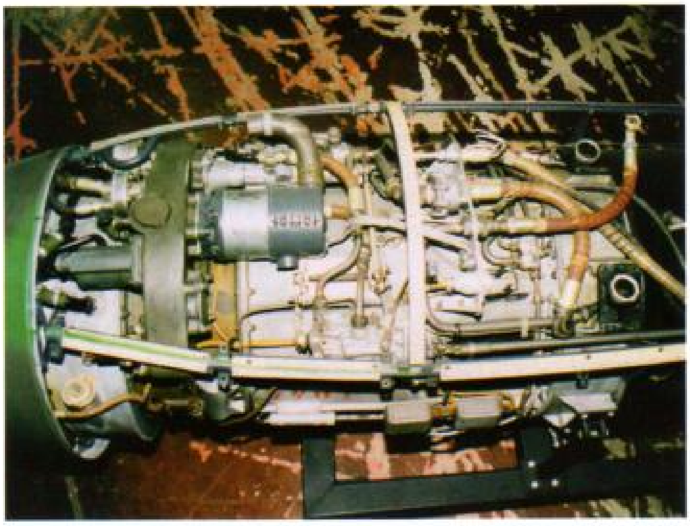
The port sidewall

This starboard sidewall, note the flare pistol locked in position

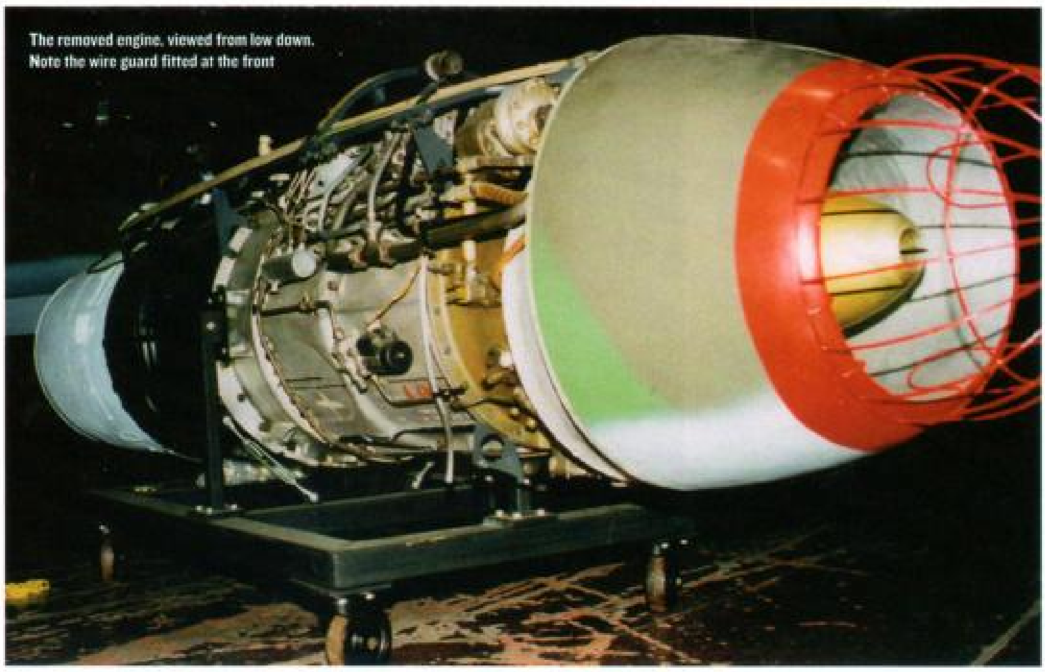
This is the view into the extensively glazed nose of the Ar 234. The instrument panel is prominent in this area

On the port side of the forward fuselage, aft of the canopy glazing, is this fold-down panel that also acts as an access step

The port mainwheel oleo, viewed from the inside

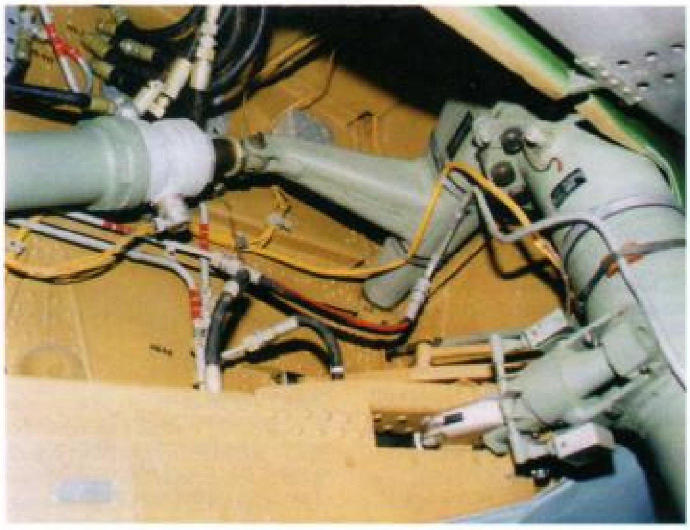


Both engines were off the airframe at the time, so here you can see one unit from the top without any of the covers fitted



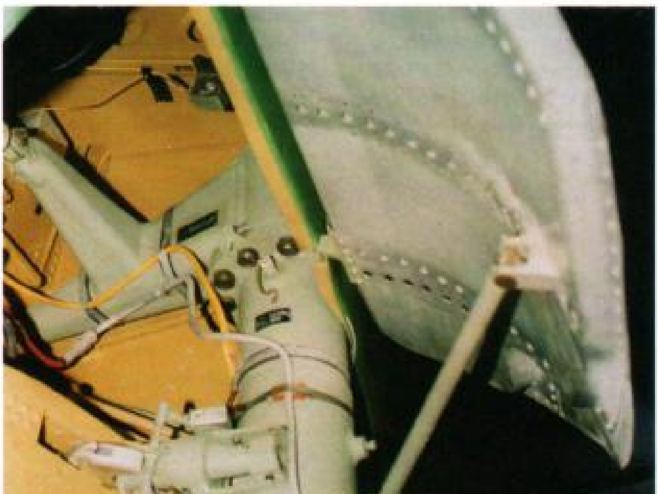
The removed engine, viewed from low down. Note the wire guard fitted at the front

This is the ventral bomb rack, viewed looking aft



The top of the port oleo leg, showing the swivel point and various linkage and pipework

Looking back into the main undercarriage well, the closed main door can be seen to the left



A nice shot up inside the main undercarriage door on the port side, looking aft

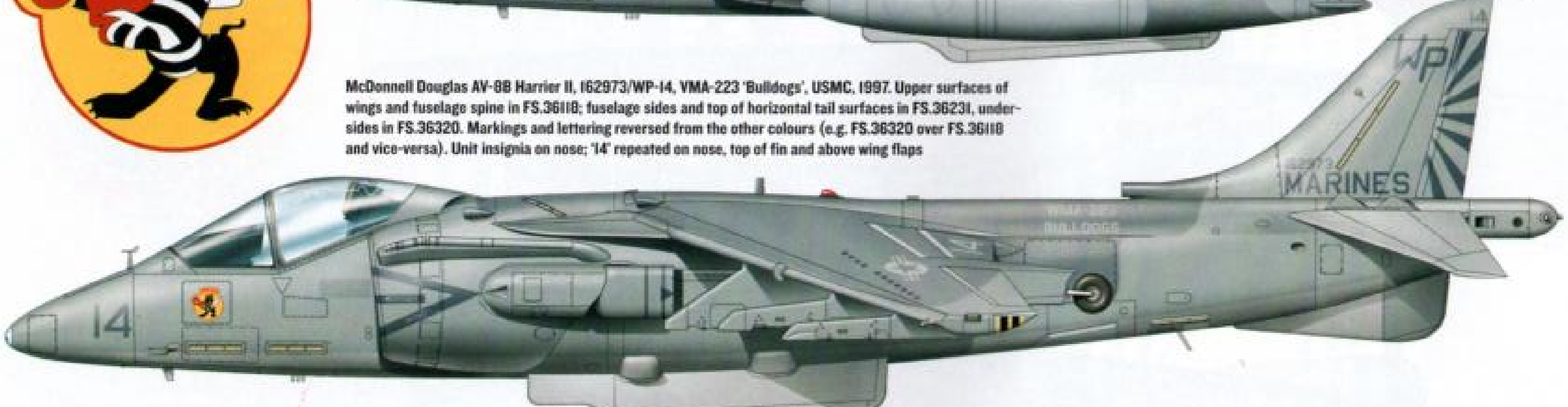
This is the parachute housing under the aft rear fuselage

This is where the cable from the ventral parachute housing is connected under the stern post

McDonnell Douglas AV-8B Harrier II, 162732/CG-08, VMA-231 'Ace of Spades', US Marine Corps. Wrap-around camouflage in FS.36320 and FS.36009 with all markings in dark grey, except for '08' on fin which is in white; unit badge of nose

Below: McDonnell Douglas AV-8B Harrier II, 164147/CF-07, VMA-211 'Avengers', US Marine Corps, 1997. Upper surfaces of wings and fuselage spine in FS.36118; fuselage sides and top of horizontal tail surfaces in FS.36231, undersides in FS.36320. Markings and lettering reversed from the other colours (e.g. FS.36320 over FS.36118 and vice-versa). Name 'Avengers' in white on dark grey stripe across top of fin, unit marking on nose

McDonnell Douglas AV-8B Harrier II, 162973/WP-14, VMA-223 'Bulldogs', USMC, 1997. Upper surfaces of wings and fuselage spine in FS.36118; fuselage sides and top of horizontal tail surfaces in FS.36231, undersides in FS.36320. Markings and lettering reversed from the other colours (e.g. FS.36320 over FS.36118 and vice-versa). Unit insignia on nose; '14' repeated on nose, top of fin and above wing flaps



Profiles 1:72 Scale

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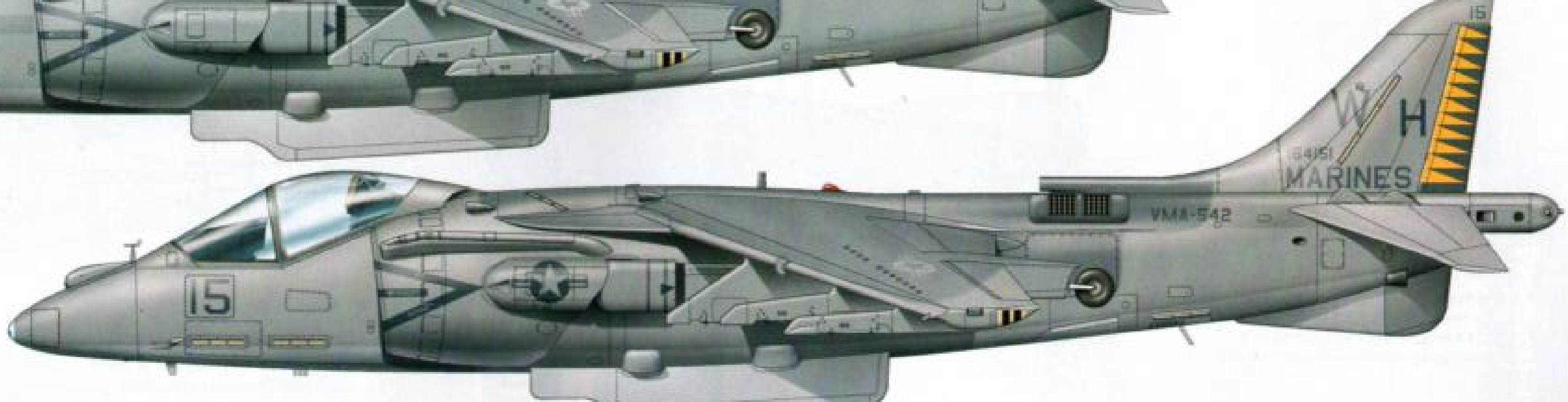
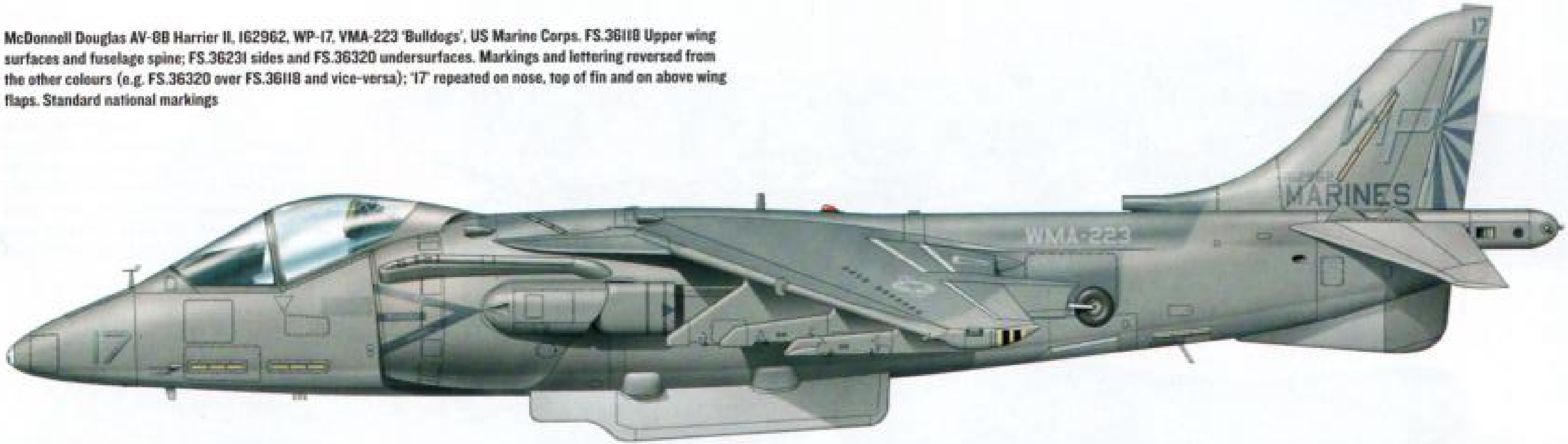
McDonnell Douglas AV-8B Harrier II, 164151/WH-15, VMA-542 'Tigers', US Marine Corps. Upper surfaces of wings and fuselage spine in FS.36118; fuselage sides and top of horizontal tail surfaces in FS.36231, undersides in FS.36320. Markings and lettering in dark grey; fin in dark grey with yellow motif. '15' repeated on top of fin



McDonnell Douglas AV-8B Harrier II, 162962, WP-17, VMA-223 'Bulldogs', US Marine Corps. FS.36118 Upper wing surfaces and fuselage spine; FS.36231 sides and FS.36320 undersurfaces. Markings and lettering reversed from the other colours (e.g. FS.36320 over FS.36118 and vice-versa); '17' repeated on nose, top of fin and on above wing flaps. Standard national markings



Below: McDonnell Douglas AV-8B Harrier II, 163868/WL-20, VMA-311 'Tomcats', US Marine Corps, 2007. Upper surfaces of wings and fuselage spine in FS.36118; fuselage sides and top of horizontal tail surfaces in FS.36231, undersides in FS.36320. Markings are in a mix of dark light grey; note dark grey motif around air intake

McDonnell Douglas AV-8B, 163867, KD-20, VMAT-203 'Hawks', US Marine Corps, 2007. Upper surfaces of wings and fuselage spine in FS.36118; fuselage sides and top of horizontal tail surfaces in FS.36231, undersides in FS.36320. Black fin and rudder with lettering in red, outlined in yellow; unit badge on nose

Profiles 1:72 Scale

0 METRES 1 2

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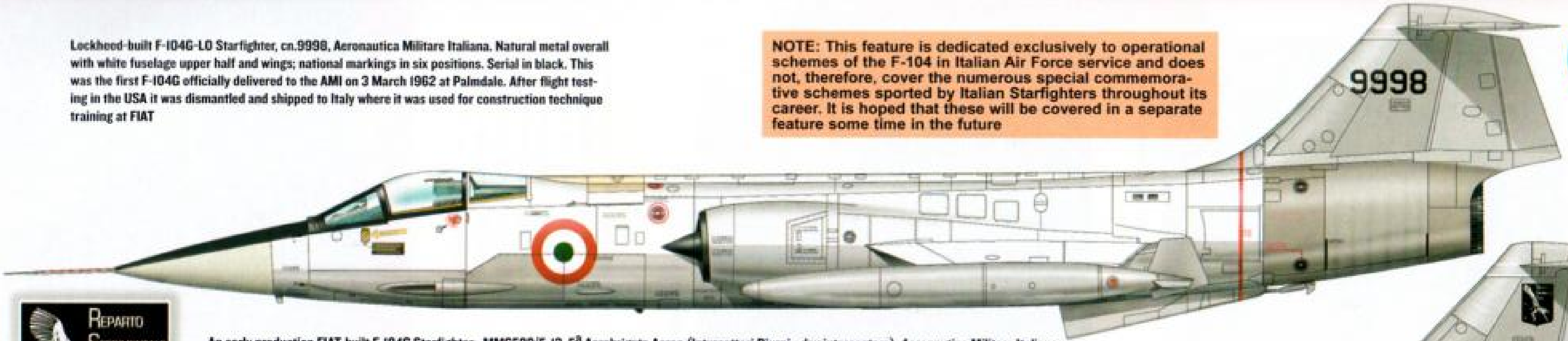
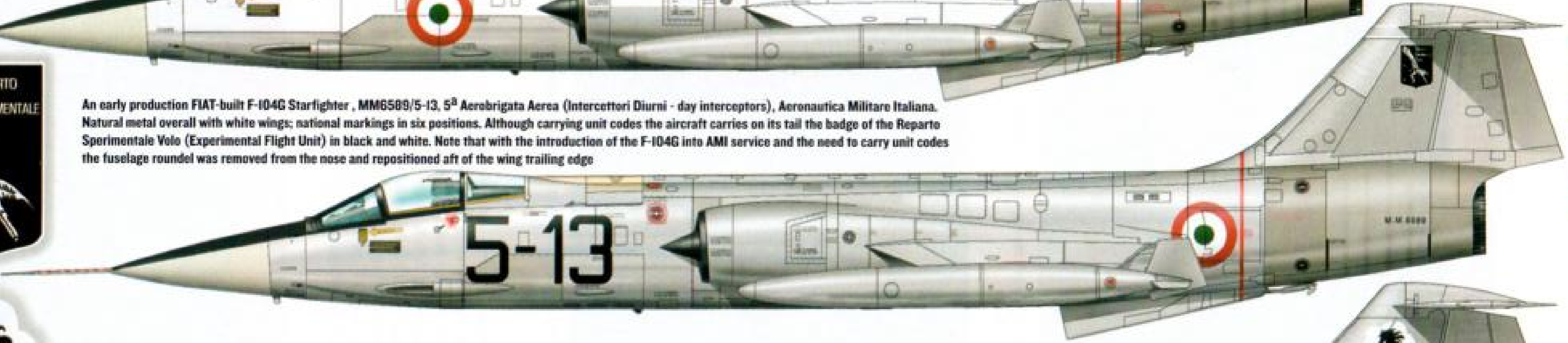
McDonnell Douglas EAV-8B Harrier II, 01-910, Spanish Navy, 1999. FS.36230 upper surfaces with FS.36375 undersides and lettering on upper surfaces; national markings in six positions. Winged crown in gold on fin

Lockheed-built F-104G-LO Starfighter, cn.9998, Aeronautica Militare Italiana. Natural metal overall with white fuselage upper half and wings; national markings in six positions. Serial in black. This was the first F-104G officially delivered to the AMI on 3 March 1962 at Palmdale. After flight testing in the USA it was dismantled and shipped to Italy where it was used for construction technique training at FIAT

NOTE: This feature is dedicated exclusively to operational schemes of the F-104 in Italian Air Force service and does not, therefore, cover the numerous special commemorative schemes sported by Italian Starfighters throughout its career. It is hoped that these will be covered in a separate feature some time in the future



An early production FIAT-built F-104G Starfighter , MM6589/5-13, 5ª Aerobrigata Aerea (Intercettori Diurni - day interceptors), Aeronautica Militare Italiana. Natural metal overall with white wings; national markings in six positions. Although carrying unit codes the aircraft carries on its tail the badge of the Reparto Sperimentale Volo (Experimental Flight Unit) in black and white. Note that with the introduction of the F-104G into AMI service and the need to carry unit codes the fuselage roundel was removed from the nose and repositioned aft of the wing trailing edge



F-104G Starfighter, MM.6505/4-5, 4ª Aerobrigata Aerea (intercettori Diurni), Aeronautica Militare Italiana, Grosseto, 1963. Natural metal overall with white wings; national markings in six positions. 'Cavallino Rampante' (Prancing Horse) badge on fin in black within a white 'cloud'; codes and serials in black

F-104G Starfighter, MM.6601/6-26, 6º Stormo, Aeronautica Militare Italiana, Ghedi, 1982. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions White codes; red flash on fin. 'Diavolo Rosso' (Red Devil) Stormo marking on fin both sides facing forwards

Profiles 1:72 Scale

0 METRES 1 2

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ART 2 DECAL

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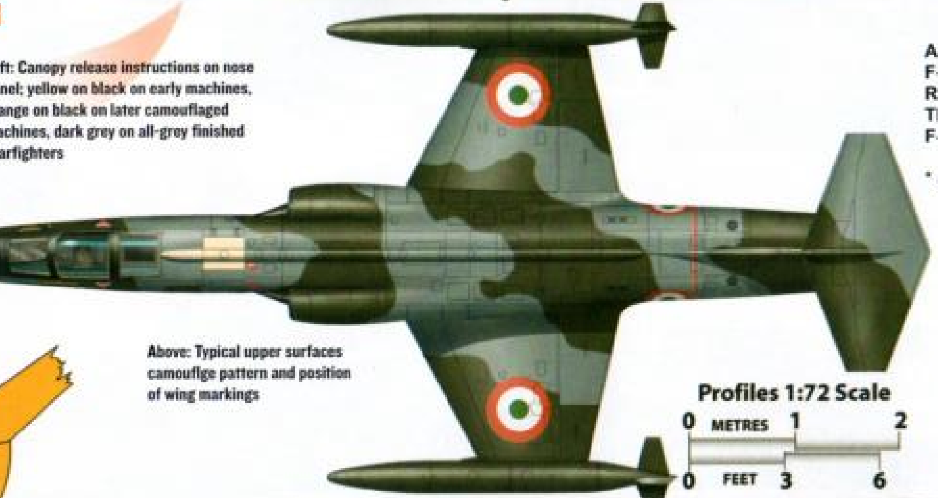
ITALIAN F-104 STARFIGHTERS

Above: Stencilled warning painted on anti-dazzle panel; yellow lettering is white on all-grey finished Starfighters

F-104G Starfighter, MM.6567/3-02, 132° Gruppo, 3° Stormo Aeronautica Militare Italiana, Verona-Villafranca, 1986. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Codes and 'C.E. Buscaglia' on fin in white; Gruppo badge on air intakes. Red flashes on fin leading edges

Left: Canopy release instructions on nose panel; yellow on black on early machines, orange on black on later camouflaged machines, dark grey on all-grey finished Starfighters



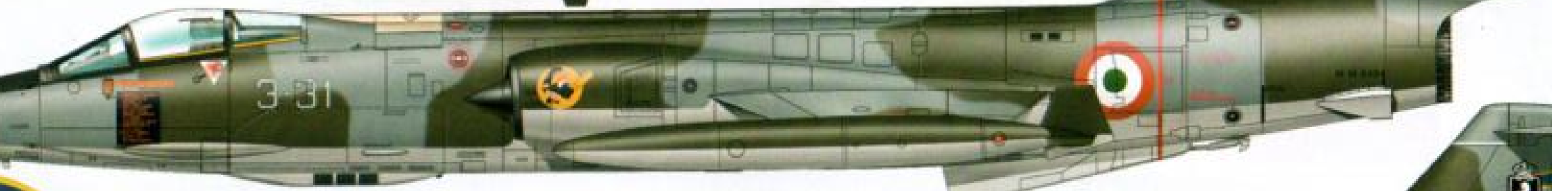
Above: Typical upper surfaces camouflge pattern and position of wing markings

AERONAUTICA MILITARE ITALIANA F-104 SERIALS

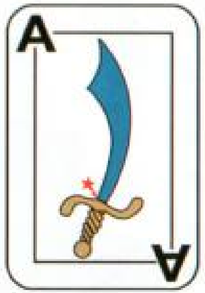
F-104G:	9998, MM.6501-6599; MM.6601, MM.6608-6611; MM.6631
RF-104G:	MM.6632-6638; MM.6643-6651; MM.6658-6660
TF-104G:	MM.54226-54237; MM.542550-54261
F-104S:	MM.6658*, MM.660*, MM.6701-6850; MM.6869-6881; MM.6886-6887; MM.6890, MM.6907-6946

* *ex-F-104Gs*

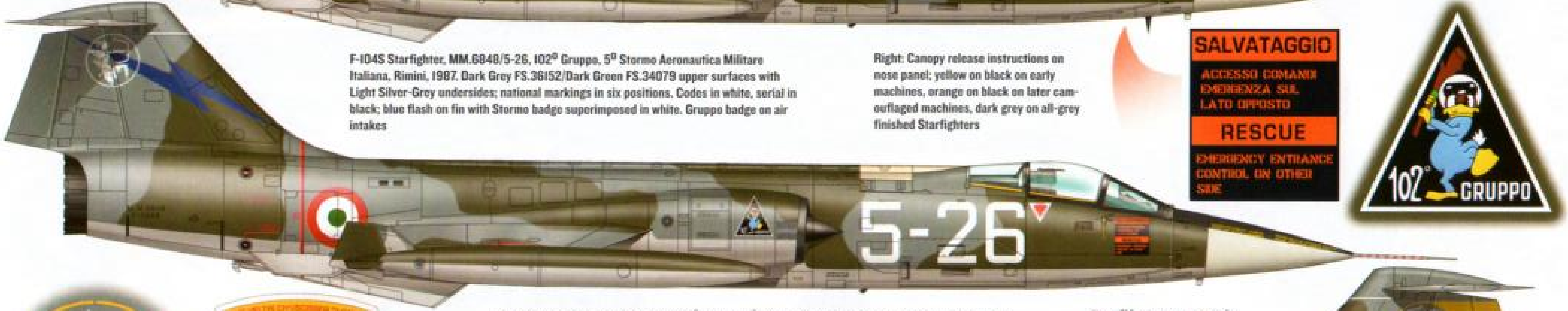
Below: RF-104G Starfighter, MM.6634/3-31, 28° Gruppo 'Streghe' (Witches), 3° Stormo, Aeronautica Militare Italiana, Verona/Villafranca, 1990. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Light Blue codes thinly outlined in black; Gruppo badge on engine intakes, Stormo badge on fin. Yellow fin leading edge; C.E. Buscaglia in white on fin (both sides)



TF-104G Starfighter, MM54227/4-28, 20° Gruppo, 4° Stormo, Aeronautica Militare Italiana, Grosseto, 1987. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Codes in light blue, thinly outlined in black; blue flash, outlined in yellow, on fin. Stormo 'Cavallino Rampante' (Prancing Horse) badge on fin with the Gruppo badge on air intakes



F-104S Starfighter, MM.6772/53-20, 21° Gruppo 'Tigre' (Tigers), 53° Stormo Aeronautica Militare Italiana, Tiger Meet 1985. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Codes in white, with '20' repeated on fin; yellow-orange fin with black 'tiger' patches. Gruppo badge on air intakes, Stormo badge on fin



F-104S Starfighter, MM.6848/5-26, 102° Gruppo, 5° Stormo Aeronautica Militare Italiana, Rimini, 1987. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Codes in white, serial in black; blue flash on fin with Stormo badge superimposed in white. Gruppo badge on air intakes

Right: Canopy release instructions on nose panel; yellow on black on early machines, orange on black on later camouflaged machines, dark grey on all-grey finished Starfighters

F-104S Starfighter, MM.6814/5-42, 23° Gruppo, 5° Stormo Aeronautica Militare Italiana, recorded at Sigonella in the summer of 1985. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver Grey undersides; national markings in six positions. White codes, black serial; Stormo 'Diana' badge on fin together with two horizontal yellow stripes. Gruppo badge on air intakes

Profiles 1:72 Scale

F-104S Starfighter, MM.6875/50-03, 155° Gruppo 'Pantere Nere' (Black Panthers), 50° Stormo, Aeronautica Militare Italiana, Piacenza. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. White codes on forward fuselage; blue flashes on fin with the Stormo badge superimposed. Gruppo badge on air intakes

F-104S Starfighter, MM.6783/51-06, 22° Gruppo, 51° Stormo, August 1981. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. White codes; red flash on fin with Stormo badge superimposed. Gruppo badge on air intakes

F-104S Starfighter, MM.6701/RS-06, Reparto Sperimentale Volo (Experimental Flying Unit), Trapani, April 1988. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. White codes and black serial; unit badge on fin

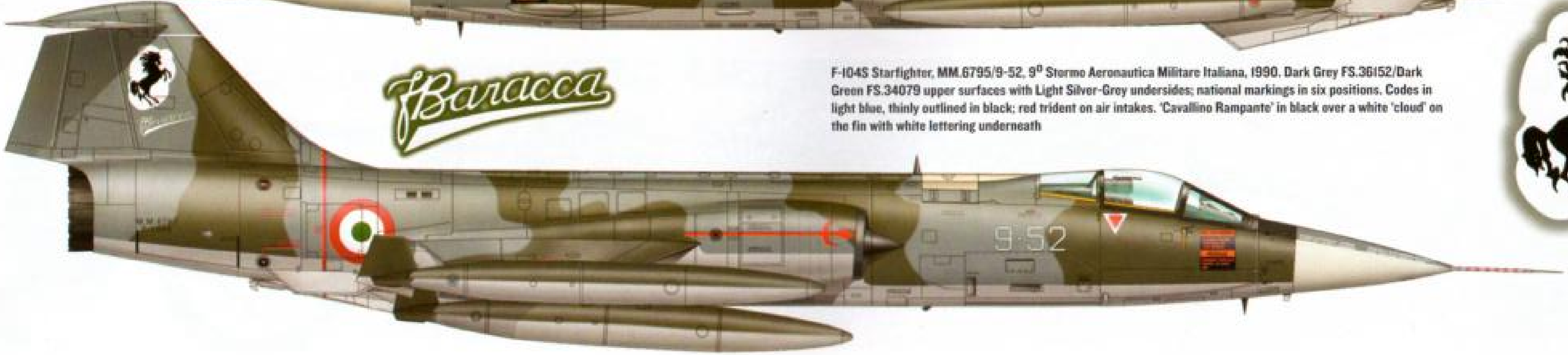
F-104S ASA Starfighter, MM.6826/36-01, 12° Gruppo, 36° Stormo, Aeronautica Militare Italiana, Gioia Del Colle, 1989. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. White codes in the style adopted for AMI's Tornados; green flash on fin with Stormo badge superimposed. Gruppo badge on air intakes

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

F-104S Starfighter, MM.6795/9-52, 9° Stormo Aeronautica Militare Italiana, 1990. Dark Grey FS.36152/Dark Green FS.34079 upper surfaces with Light Silver-Grey undersides; national markings in six positions. Codes in light blue, thinly outlined in black; red trident on air intakes. 'Cavallino Rampante' in black over a white 'cloud' on the fin with white lettering underneath



F-104S ASA Starfighter, MM.6909/37-23, 18º Gruppo, 37º Stormo Aeronautica Militare Italiana, Trapani-Birgi, July 1991. Experimental scheme applied to this aircraft in colours similar to Air Superiority Greys (though the upper colour appears to be darker than that applied to its successor, the F-14); national markings in six positions. Markings in black with the Gruppo badge on the air intakes and Stormo badge on fin; fuel tanks remain in Dark Green upper surfaces and Light Silver Grey undersides

F-104S ASA Starfighter, MM.6713/4-2, 4º Stormo Aeronautica Militare Italiana. Air Superiority Grey overall with codes in light blue, thinly outlined in black; national markings on fuselage sides, above port and below starboard wings. Cavallino Rampante badge on fin both sides

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

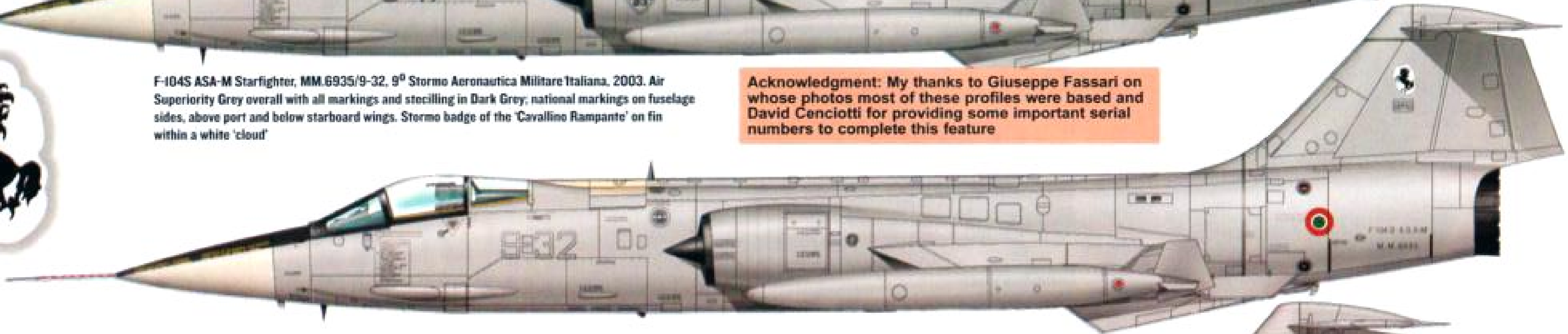
F-104S ASA Starfighter, MM.6875/9-33, 9º Stormo Aeronautica Militare Italiana, 1998. Air Superiority Grey overall all markings in dark grey; national markings on fuselage sides, above port and below starboard wings. Cavallino Rampante badge on fin both sides; 75th AMI anniversary logo on starboard side only

F-104S ASA Starfighter, MM.6940/51-22, 22º Gruppo, 51º Stormo Aeronautica Militare Italiana, Istrana, 1999. Air Superiority Grey overall with all markings and stecilling in Dark Grey; national markings on fuselage sides, above port and below starboard wings. '51-' of code is in dark grey (outline), '22' in red, highlighted in white. Gruppo badge on air intakes, Stormo badge over a red flash on fin. The decorated '22' was applied for the final flight of the type with this unit, 30 January 1999

F-104S ASA-M Starfighter, MM.6793/5-47, 23° Gruppo, 5° Stormo Aeronautica Militare Italiana, as seen during an open day at RAF Cottesmore in July 2000. Air Superiority Gray overall with all lettering and numbers in dark grey; national markings on fuselage sides, above port and below starboard wings. Gruppo badge on air intakes, Stormo badge on fin, both in dark grey

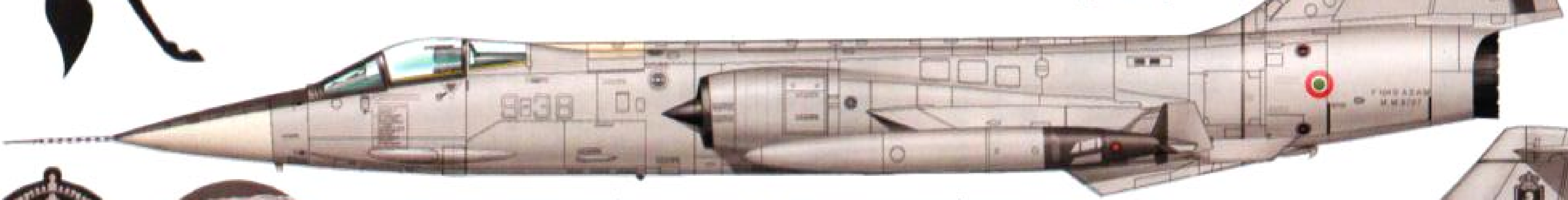
F-104S ASA-M Starfighter, MM.6935/9-32, 9° Stormo Aeronautica Militare Italiana, 2003. Air Superiority Grey overall with all markings and stecilling in Dark Grey; national markings on fuselage sides, above port and below starboard wings. Stormo badge of the 'Cavallino Rampante' on fin within a white 'cloud'

Acknowledgment: My thanks to Giuseppe Fassari on whose photos most of these profiles were based and David Cenciotti for providing some important serial numbers to complete this feature

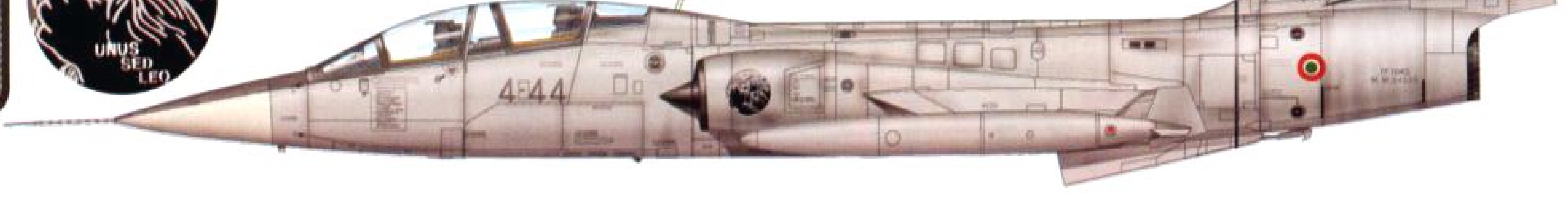


F-104S ASA-M Starfighter, MM.6787/9-38, 9° Stormo Aeronautica Militare Italiana, 2003. Air Superiority Grey overall with all markings and stecilling in Dark Grey; national markings on fuselage sides, above port and below starboard wings. Although wearing 9° Stormo codes, this aircraft still carries 37° Stormo markings on fin and rudder t which it previously belonged; rear of port wingtip tank appears to have been decorated in a dark grey and blue grey motif

Profiles 1:72 Scale



TF-104G Starfighter, MM.54553/4-44, 20° Gruppo Addestrativo Operativo (Operational Training Unit), 4° Stormo Aeronautica Militare Italiana, November 2000. Air Superiority Grey overall with all markings in dark grey; national markings on fuselage sides, above port and below starboard wings. Gruppo badge on air intakes, Stormo badge on fin



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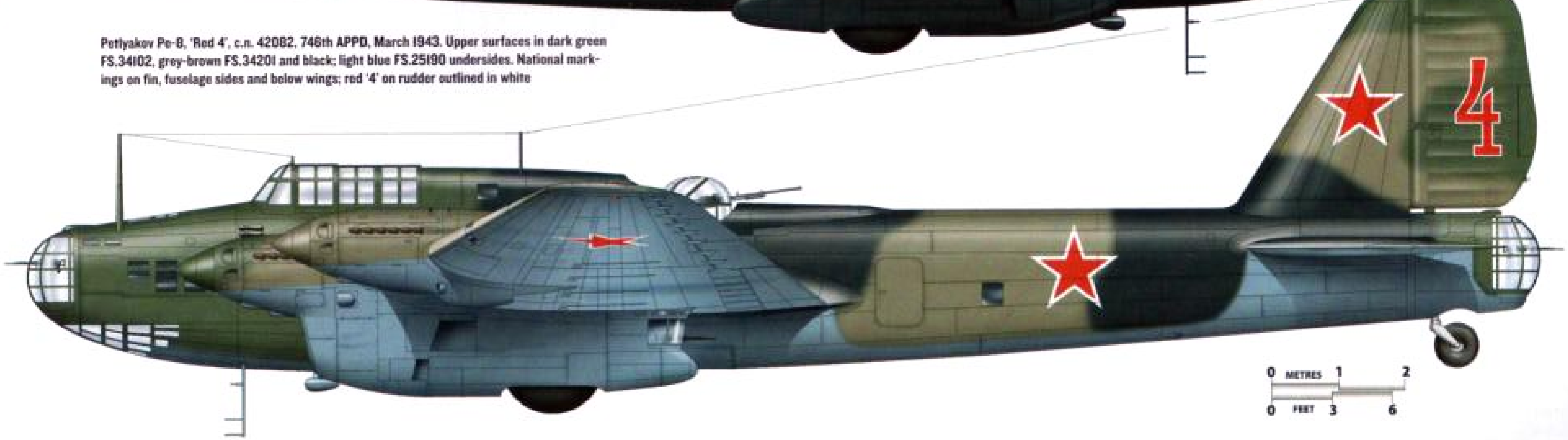
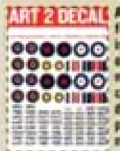
Petlyakov Pe-8, 'White 6', 432nd APPD, 1942. Upper surfaces in dark green FS.34102 and black; light blue FS.25190 undersides. National markings on fin and below wings; white 6 on rudder

Petlyakov Pe-8, 'Red 6', 25th GvAPPD, Balabasovo, 1945. Upper surfaces in dark green FS.34102, grey-brown FS.34201 and black; all black undersides. National markings on fin, fuselage sides and below wings; red '6' on rudder thinly outlined in white

Petlyakov Pe-8, 'Red 4', c.n. 42082, 746th APPD, March 1943. Upper surfaces in dark green FS.34102, grey-brown FS.34201 and black; light blue FS.25190 undersides. National markings on fin, fuselage sides and below wings; red '4' on rudder outlined in white





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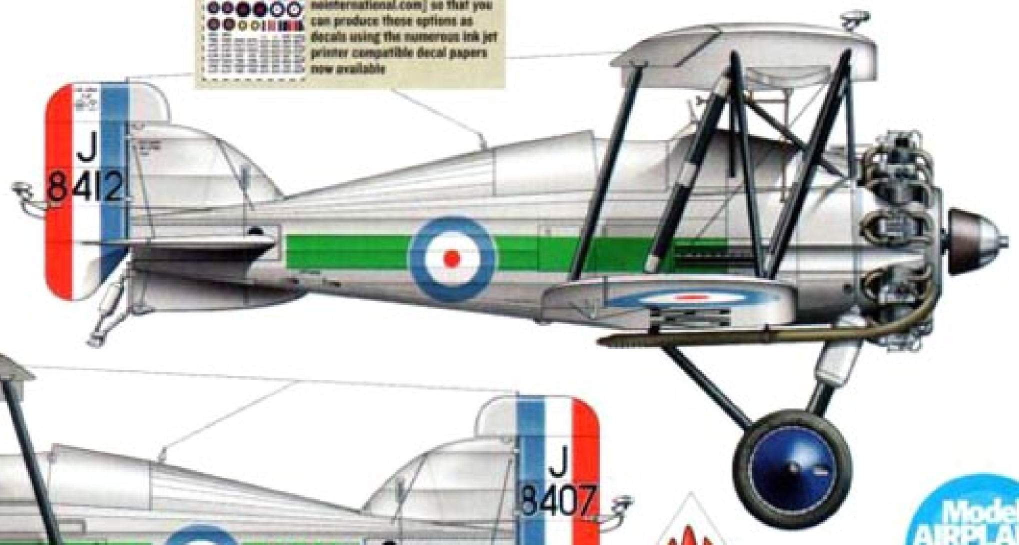
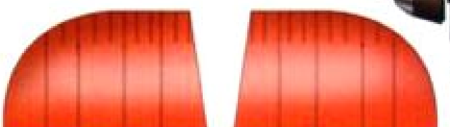
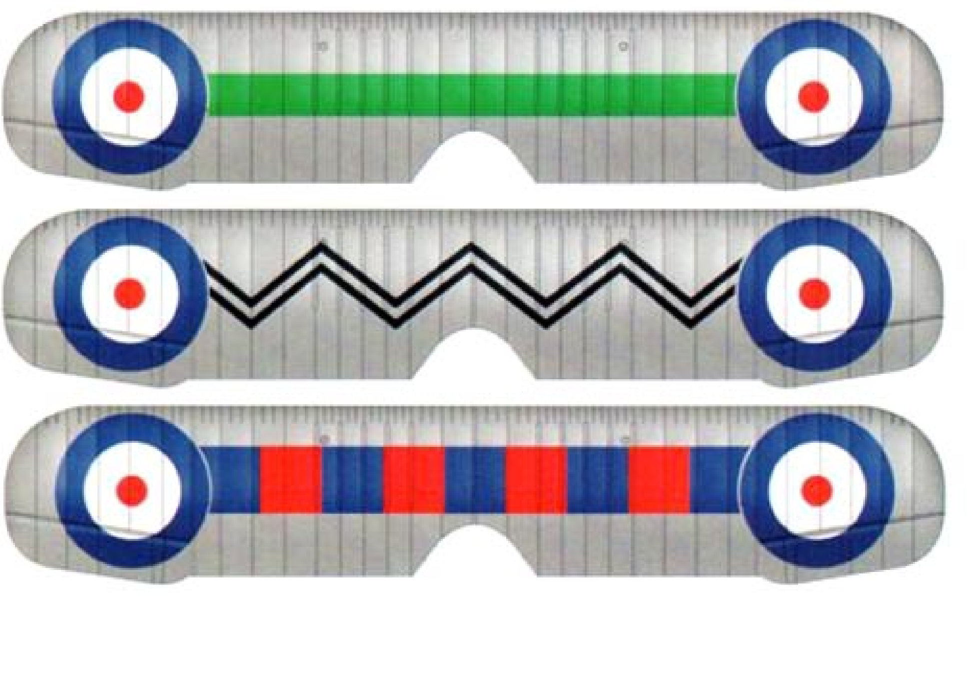
Right: Gloster Gamecock Mk I, J8412, 'C' Flight, No.3 (F) Squadron, 1926. Aluminium dope overall with natural metal panels; Emerald Green horizontal bar along fuselage sides and above top wing. Serial in black, outlined in white on rudder only; serial repeated below bottom wing inboard of roundels. Blue Flight coloured wheel covers. Note Ident Blue 3 in national markings

Below: Gloster Gamecock Mk I, J8407, 'A' Flight, No.3 (F) Squadron, 1926. Similar finish to J8412 at right except that fuselage roundels are outlined in silver. Red Flight colour on wheel covers and propeller hub. Note Ident Blue 3 in national markings





Above Right: Gloster Gamecock Mk I, J8408, 'A' Flight, No.17 (F) Squadron, Upavon, 1928. Aluminium dope overall with medium grey nose panels; orange-red fuselage dorsal area, fin, fixed pat of horizontal tail surfaces and wheel covers. Black zig-zag along fuselage sides and above top wing; black serial, outlined in white on rudder, repeated in black only below bottom wings and above moveable horizontal tail surfaces (see above). Squadron 'Gauntlet' marking in orange-red, on a white diamond, on fin



Above: Gloster Gamecock Mk I, J8084, No.23 (F) Squadron, Henlow. Aluminium dope overall with natural metal panels; area around cockpit in medium grey. Blue/red markings along fuselage sides and above top wing; serial in black, repeated below bottom wings inboard of roundels (those on rudder outlined in white. Red wheel covers and propeller hub; rank pennant below cockpit

Left: Wing markings for (top to bottom) No.3, No.17 and No.23 Squadron Gamecocks

PROFILES
1:48 Scale

0 Metres 1 2
0 Feet 3 6

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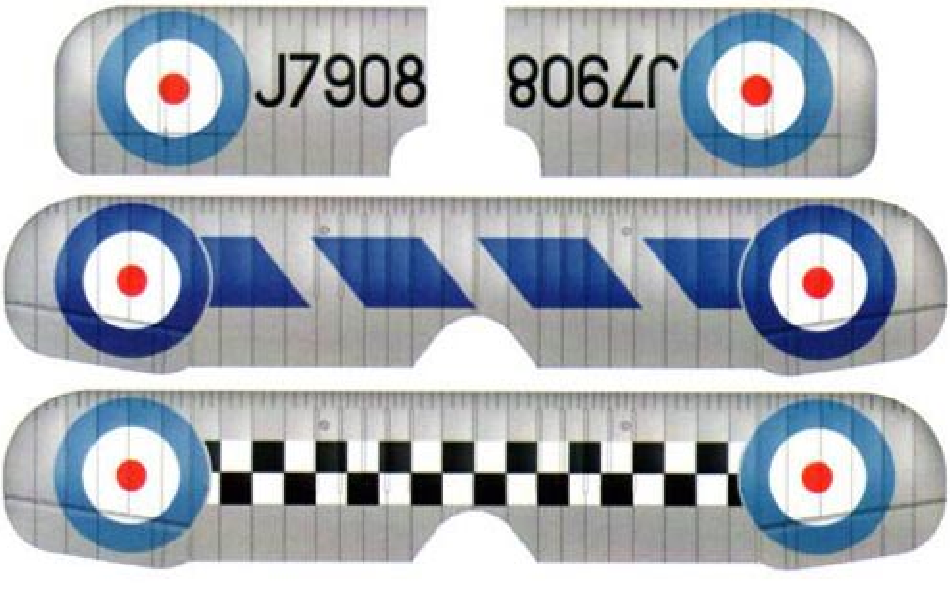
Gloster Gamecock Mk I, J-8081, 'C' Flight, No.32 (F) Squadron, Kenley, 1926. Aluminium dope overall with natural metal panels; blue bars along fuselage sides and above top wing. Black serial, outlined in silver on fuselage and in white on rudder; serial repeated below bottom wings. Blue Flight colours to propeller hub and wheel covers

Gloster Gamecock Mk I, J8073, 'A' Flight, No.32 (F) Squadron, Kenley, May 1927. Aluminium overall with natural metal panels and dark grey fuselage decking around cockpit; blue bar markings along fuselage sides and above top wing. Black serial, outlined in silver on fuselage and in white on fin; serial repeated below wings, inboard of roundels. Red Flight colour on wheel covers

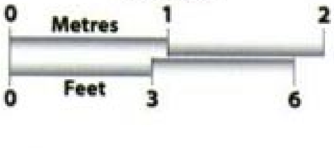
Gloster Gamecock Mk I, J7908, 'A' Flight, No.43 (F) Squadron, 1926. Aluminium dope overall with medium grey nose an dorsal fuselage panels; black/white checks along fuselage sides and above top wing. Red flight colour on wheel covers; early style Ident Blue 3 to all national markings

Below: position and size of roundels and markings below the bottom wings; early style national markings shown, in Ident Blue 3
Bottom: Gamecock upper wing markings for (top to bottom) No. 32 and No. 43 Squadrons; the latter shows the early style roundel colours in Ident Blue 3 (refer to J7908)

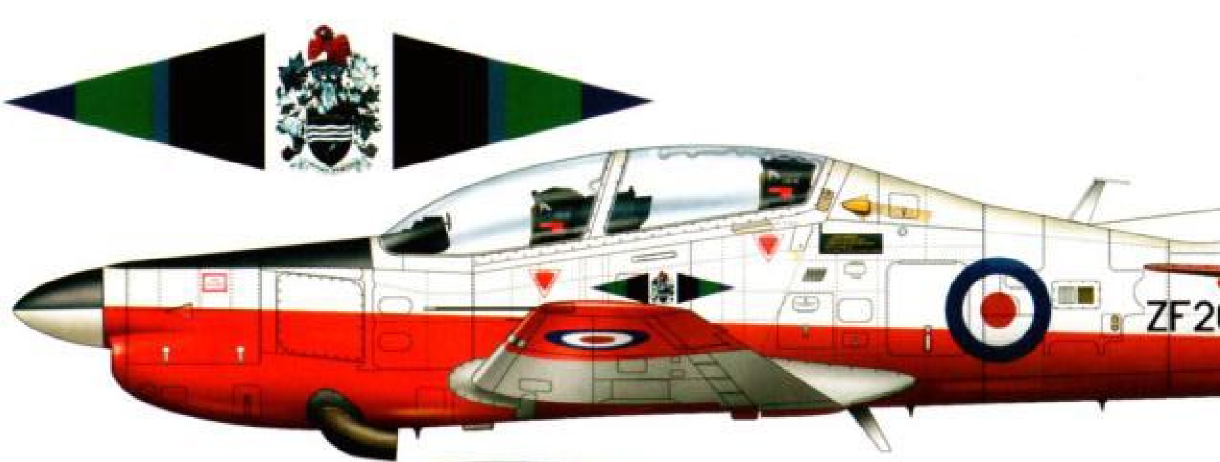


Gloster Gamecock Mk I, J-8090, 'A' Flight, No.43 (F) Squadron. Aluminium overall with medium grey nose and upper decking of forward fuselage; black/white checks along fuselage sides and above top wing. Red flight colour on wheel covers, fin and tailplane; serials in black, those on rudder outlined in white. Serial repeated below bottom wings, inboard of roundels; note this aircraft is flying a red pennant

PROFILES
1:48 Scale



Right: Shorts Tucano T.I, ZF205, Central Flying School, 1989. Signal Red overall with white upper fuselage; Light Aircraft Grey inner sections of wings. Black anti-dazzle panel; black/white (halved) spinner. Standard national markings with roundels in six positions; CFS crest on fuselage sides, flanked by multi-coloured flash



Above:: Shorts Tucano T.I, ZF145, No. 7 Flying Training School, Church Fenton, 1990. Signal Red overall with white upper fuselage; Light Aircraft Grey inner sections of wings. Dark Blue flash along fuselage sides; black anti-dazzle panel. Black/white (halved) spinner. Standard national markings with roundels in six positions; 'Tucano' painted on fin rudder, both sides; '7FTS' in white on engine cowling

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Shorts Tucano T.I, ZF417, No.I FTS, 2004. Gloss black overall with standard national markings all thinly outlined in white; matt black anti-dazzle panel, black/white halved spinner. Yellow cheatline on fuselage, and yellow triangles above and below wings; serial in white, with the last three digits repeated above fin flash and nose. '417' in black on trailing edge of wing within the yellow triangle; No.I FTS crest on fin

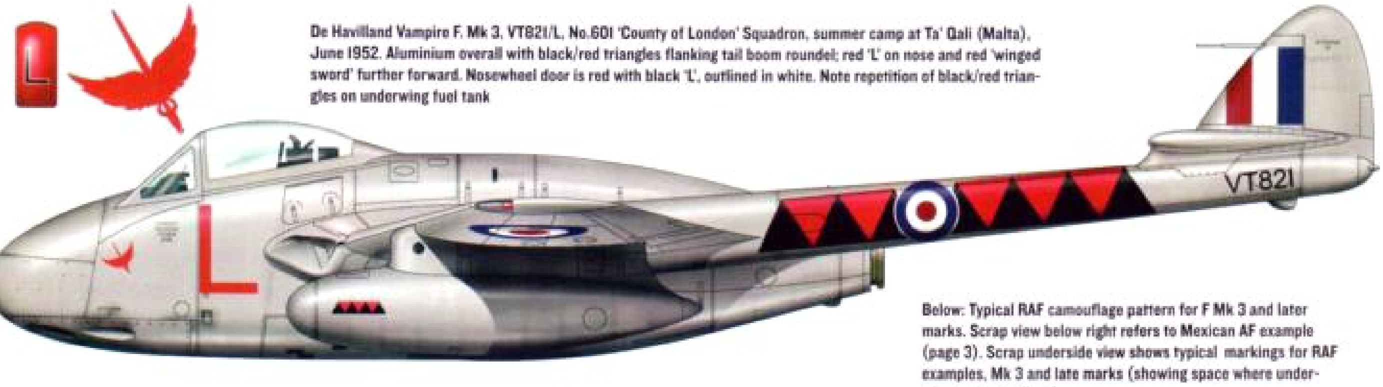
Far Right: Shorts Tucano T.I, ZF349 'Lewis & Harris Fighter', No.72 (R) Squadron, 2005. Gloss black overall with standard national markings all thinly outlined in white; matt black anti-dazzle panel, black/white halved spinner. Blue/red bars flanking fuselage roundels; angled yellow flashes above wings with '349' repeated in black at the trailing edge. Unit badge on fin, also flanked by blue/red bars

Below: Shorts Tucano T.I, ZF139, No. 207 (R) Squadron, 2006. Gloss black overall with standard national markings all thinly outlined in white; matt black anti-dazzle panel, black/white halved spinner. Red/yellow bars flanking fuselage roundels; unit badge on fin within a white disc, outlined in red

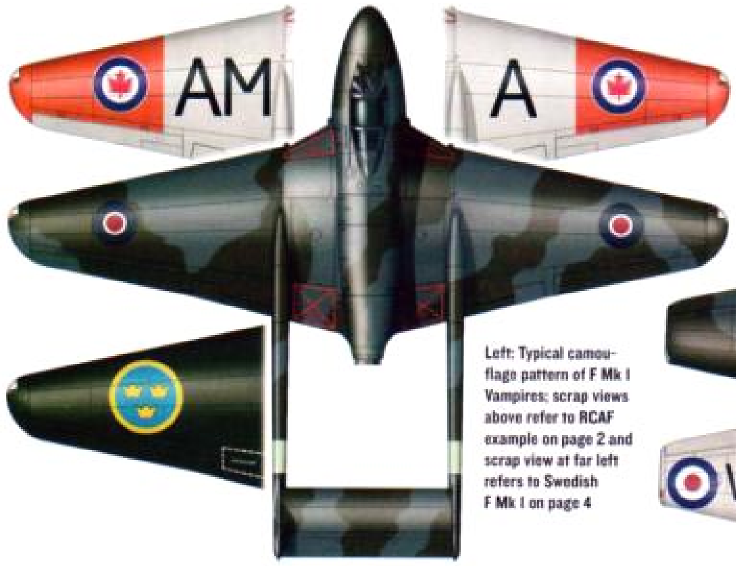
De Havilland Vampire F Mk I, TG/297, ZY-C, No.247 Squadron, 1946. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; standard national markings. Codes and tail boom bands in Sky; serial in black, repeated below wings. Unit badge on fin

De Havilland Vampire F Mk I, VF/306, AP-V of No.130 Squadron, Odiham, 1947. Aluminium overall with 'B' style roundels on booms and above wings; Dull Red/Dull Blue fin flashes. Codes and serials in black, the latter repeated below the wings

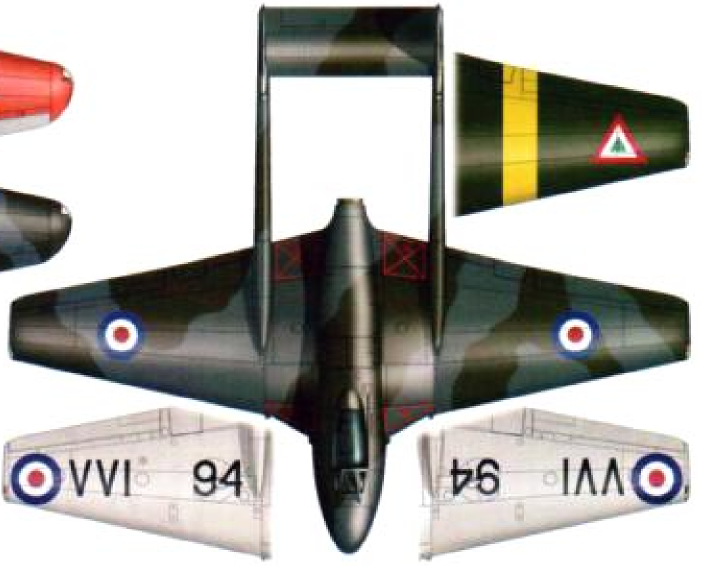
De Havilland Vampire F Mk I, TG/342, RAL-L, No.605 'County of Warwick' Squadron, 1948. Medium Sea Grey uppersurfaces and PRU Blue undersides. 'Bright' roundels in six positions. Serial in black, repeated under wings; codes in white, with 'L' repeated on a Dark Blue nosewheel door. Note white panel above nose; tanks are Aluminium



De Havilland Vampire F. Mk 3, VT821/L, No.601 'County of London' Squadron, summer camp at Ta' Qali (Malta), June 1952. Aluminium overall with black/red triangles flanking tail boom roundel; red 'L' on nose and red 'winged sword' further forward. Nosewheel door is red with black 'L', outlined in white. Note repetition of black/red triangles on underwing fuel tank



Left: Typical camouflage pattern of F Mk I Vampires; scrap views above refer to RCAF example on page 2 and scrap view at far left refers to Swedish F Mk I on page 4



Below: Typical RAF camouflage pattern for F Mk 3 and later marks. Scrap view below right refers to Mexican AF example (page 3). Scrap underside view shows typical markings for RAF examples, Mk 3 and late marks (showing space where underwing tanks are fitted

TG/386, from the fourth batch of F Mk I Vampires, finished in early scheme of Medium Sea Grey upper surfaces and PRU Blue undersides. Note 'B' style roundels on boom and 'C' style above wings (R.J. Caruana Archives)

THE DE HAVILLAND D.H.100 VAMPIRE

Having given the RAF the 'Wooden Wonder', de Havilland turned their attention to a jet-powered design that also used wood in its construction

Well before the Air Ministry had issued Specification E.6/41, calling for an experimental prototype jet fighter, de Havilland had the opportunity to review work carried out on the first British jet to get airborne, the Gloster E.28/39. Data from the work carried out by Gloster and Frank Whittle on jet-powered aircraft was carefully evaluated before de Havilland embarked on detail design early in 1942. Notwithstanding the 'experimental' nature of the specification, provision for armament was included. de Havilland's plans for the new fighter took off with a bold move when a choice was made for a single powerplant instead of two, as Gloster had done for its Meteor. Moreover, the company took upon itself the task of developing its own jet engine under the direction of Major Frank Halford. This engine, eventually to become the Goblin I, was experimentally flown and tested in the only Meteor Mk 2, DG207/G (the 'G' suffix stands for 'guard', meaning that the aircraft had to be under strict guard at all times).

Another unusual feature was the twin-boom layout, which economised considerably on fuselage weight. Its construction was also typically de Havilland, adopting the Mosquito's balsa-ply method for the fuselage nacelle while wings, booms and tail were built in aluminium alloy. The quartet of 20mm Hispano cannon, with 150 rounds per gun, was housed in a tray beneath the front nose section.

Progress on project 'Spider Crab' (the code-name for the D.H.100), however, was slow as production of the Mosquito took precedence on all other work. Three prototypes were constructed, LZ548/G, LZ551/G and MP838/G, of which the first performed its maiden flight from Hatfield on 20 September 1943. By that time the name 'Vampire' had been adopted for the new fighter.

Comments about the aircraft's handing and cockpit layout were generally favourable while the heavy canopy framing was criticised as obstructing the pilot's vision. By 13 May 1944, when de Havilland received an order for 120 Mk Is (later raised to 300 examples) all three prototypes had flown. With Mosquito production dominating de Havilland's facilities, arrangements were made with English Electric for the production of Vampires at their plants in Chester and Samlesbury.

The prototypes were characterised by a high, triangular-shaped fin and rudder, very reminiscent of the Mosquito's, which was later cut down to the more familiar square shape of the early models. The first production F Mk I flew on 20 April 1945, followed by a handful of others by VE-Day (the end of hostilities in Europe). Fortunately for the Vampire, its novelty helped to spare it from the post-war axe that cut short the life of so many other experimental or prototype aircraft still under development.

Another year had to pass before the first Vampires entered service with the Royal Air Force (RAF), beginning with No. 247 Squadron of the Odiham Wing, just in time to participate in the Victory Fly-Past over London the following June. The Vampire F Mk I began to take over the role of pure interceptor from such types as the Typhoon, Mustang and even Tempest, equipping squadrons of the 2nd Tactical Air Force in Germany. On 3 July 1948 it became the first jet fighter to enter service with the Royal Auxiliary Air Force (RAuxAF), replacing No. 605 Squadron's Mosquitos.

FURTHER DEVELOPMENT

While the first production Vampires were being readied for delivery, a second-generation D.H.100 was taking shape. Three experimental Nene-powered Mk IIs were built (TG276, TG280, TX807). The last of the batch was shipped to Australia, becoming A78-2, where its development work on the Rolls-Royce powered Vampire continued. This type was eventually built as the F Mk 30 for the Royal Australian Air Force (RAAF).

A chronic lack of range dogged the Vampire's early service life, until the arrival of the Mk III. Provision was made for 100 or 200 gallon drop tanks to be fitted under the wings in place of earlier attempts to fit (Mosquito) slipper tanks. The new version was covered by Specification F.2/47 (by which time designations switched from Roman to Arabic numerals). Further modifications were made in several other areas. Most noticeable was the redesign of the fins and rudders, together with the lowering of the tailplane and the addition of bullet fairings where the latter were attached to the tail booms. VF335, the first F Mk 3, took to the air on 4 November 1946. Of note was the historic first jet crossing of the Atlantic carried out by six Vampires from No. 54 Squadron (RAF), with refuelling stops at Iceland, Greenland and Labrador.

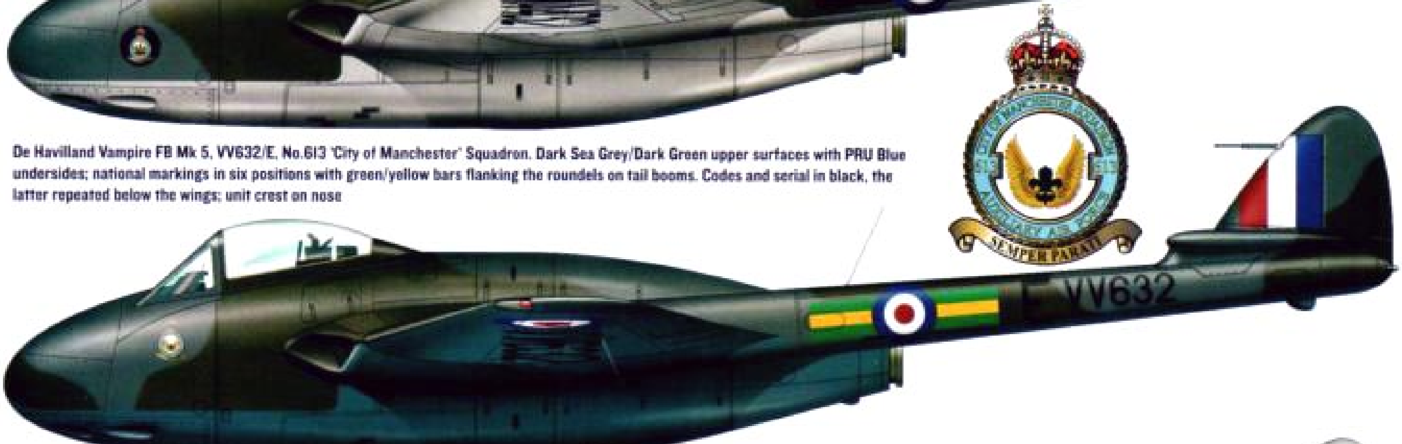
Much redesign of the Vampire wing continued not only to accommodate external fuel tanks, but also for the carriage of underwing stores such as rockets and bombs for ground attack. Trials with Vampire Mk I TG444 had successfully tested wings with clipped tips, shortening the span by 24in (309mm); ➛

One of the three F.Is acquired by Switzerland for evaluation. J-1002 remained in service up to April 1961. It is seen here during its trials in February 1948 (R.J. Caruana Archives)

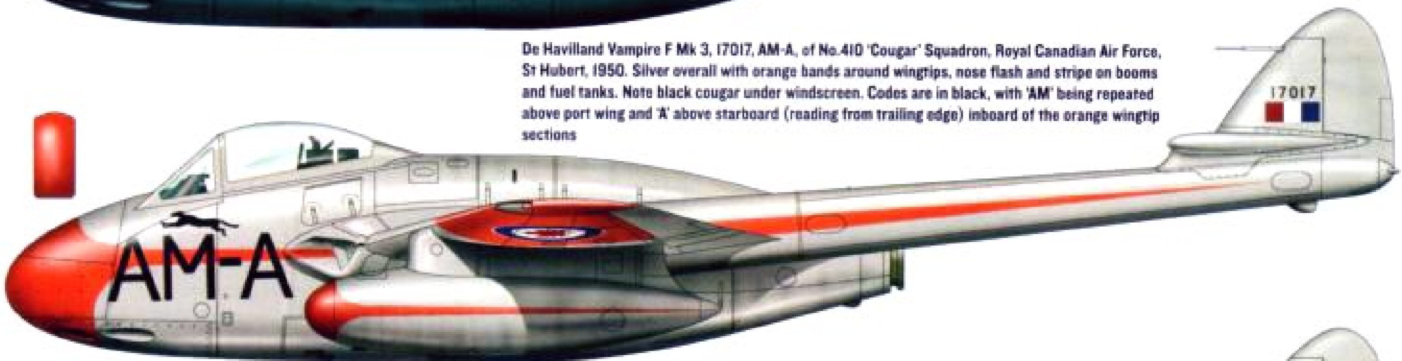
De Havilland F Mk 3, VT829, No.604 'County of Middlesex' Squadron, summer camp at Ta' Qali (Malta), June 1952. Aluminium overall with warm yellow/red triangles on nose, and red on fin bullet fairing. The unit's 'seax' (arab sword) motif is carried on the nosewheel door

De Havilland Vampire FB Mk 5, WA432, No.603 'City of Edinburgh' Squadron, September 1954. Dark Sea Grey/Dark Green upper surfaces with Aluminium undersides; national markings in six positions, with those on tail boom flanked by black bars with light blue and red checks. Serial in black, repeated below wings; unit crest on nose, over a black disc

De Havilland Vampire FB Mk 5, VV632/E, No.613 'City of Manchester' Squadron. Dark Sea Grey/Dark Green upper surfaces with PRU Blue undersides; national markings in six positions with green/yellow bars flanking the roundels on tail booms. Codes and serial in black, the latter repeated below the wings; unit crest on nose



De Havilland Vampire F Mk 3, 17017, AM-A, of No.410 'Cougar' Squadron, Royal Canadian Air Force, St Hubert, 1950. Silver overall with orange bands around wingtips, nose flash and stripe on booms and fuel tanks. Note black cougar under windscreen. Codes are in black, with 'AM' being repeated above port wing and 'A' above starboard (reading from trailing edge) inboard of the orange wingtip sections



De Havilland Vampire F Mk 3, 17036, SL-036 of No.442 'City of Vancouver' Squadron, Royal Canadian Air Force, 1954. Aluminium overall with Orange wingtips (above and below), and a nose marking in orange, white and black. All serials and codes are in black

De Havilland Vampite FB Mk 52, VH-6, HavLv 13, Finnish Air Force, 1957. Aluminium overall with national markings in six positions; serial in black, code in mid-blue thinly outlined in black. Unit badge on nose

De Havilland Vampire FB Mk 52, S-7•39 of the Nucleo Addestramento Volo a Reazzione, Aeronautica Militare Italiana, Amendola, 1953. Aluminium overall with roundels in standard six positions; codes in black. Flying School emblem on nose, fin and nosewheel door

De Havilland Vampire F Mk 3, 'Yellow 3' of Escuadron Aereo de Pelea 200, Fuerza Aerea Mexicana, 1961. Dark Green overall with yellow bands around wings and tail booms; white sharkmouth. Yellow '3' on fin, repeated on nosewheel door. National markings in six positions, those on wings always pointing towards the trailing edge

De Havilland Vampire FB Mk 5, NZ5767 of No.14 Squadron, Royal New Zealand Air Force, 1970. Silver overall with standard RNZAF roundels in six positions (those on wing with Kiwi facing forwards, legs inboard), black/white markings flanking the roundels on the booms. This aircraft was still in service during the change-over to the Skyhawk in 1970

De Havilland Vampire FB Mk 9, NZ5753, No.75 Squadron, Royal New Zealand Air Force, 1953. Dark Sea Grey/Dark Green upper surfaces with Aluminium undersides; roundels in six positions. Serial in black, repeated below wings; red bars with yellow diamonds flanking tail boom roundels

De Havilland Vampire FB Mk 52, V0412, ZK•J, No.337 Squadron, Royal Norwegian Air Force, 1956. Dark Green upper surfaces and PRU Blue undersides. Wingtips and tail bullet fairing in white. Roundels on booms, above and below wings where the triangle points towards the trailing edge; nosewheel door in white with black 'J' superimposed

De Havilland Vampire FB Mk 6, '216' of the Advanced Flying School, Pietersburg, early 1973. Aluminium overall with orange nose section, wingtips and bands around booms. Standard national marking in six positions; serial in black, repeated under wings (inboard of tanks), unit badge on both sides of nose

De Havilland Vampire F Mk I, '2722' of the Dominican Air Force, 1959. Dark Olive Green and Light Blue Grey. Roundels carried above wings and tail booms; serial in black, repeated below the wings. These were ex-Swedish machines and had the one-piece teardrop canopy

De Havilland J 28A (F Mk I), 13-K, F13, Swedish Air Force, Norrköping, 1950. Olive Green uppersurfaces and Light Blue Grey (058) undersides. '13' in yellow on booms, 'K' red outlined white on fin, repeated in white on a red nosewheel door. National markings in six positions; unit badge on both sides of nose

De Havilland Vampire FB Mk 59, F608, No. 2 Squadron, Royal Jordanian Air Force, 1955. Dark Sea Grey/Dark Green upper surfaces with Aluminium undersides; national markings in six positions, with those on the tail booms flanked by red/white checks. White triangle with red checks on nose, with superimposed black eagle on a white disc; serial in black

De Havilland Vampire FB Mk 52, No.338, of the Iraqi Air Force. Dark Earth and Mid Stone upper surfaces with Azurre Blue underside. Iraqi triangle national marking in six positions

De Havilland Vampire Mk 6, J-1156, ZFK 5, Swiss Air Force, December 1984. Aluminium overall with orange bands around outer face of tail booms; outboard flaps are also in orange (above and below). Swiss cross markings on fins, and above and below wings. The decoration was specially applied in honour of three members (including the CO) which were leaving the unit

De Havilland Vampire Mk 6, J-1128, Swiss Air Force, which performed the final operational flight of the type on 12 June 1990. Aluminium overall with orange bands around booms. Serial and anti-dazzle panel in black. Special commemorative emblem is carried on both sides

apart from the addition of strongpoints for underwing weapons to the clipped wing, its construction was also beefed up through the use of thicker wing skinning. All this resulted in faster sinking and landing speeds, necessitating a stronger undercarriage with increased travel. These changes, together with the installation of the Goblin 2 (3,000lb of thrust) were embodied in Specification F.3/47, which originally appeared with the designation GA Mk 5, later changed to FB Mk 5.

First off the production line to this standard was VV213, which flew for the first time on 23 June 1948. By the end of that year the Mk 5 began to replace the F.3 in Fighter Command, while the older type remained much longer in service with units of the RauxAF. The bulk of Vampire Mk 5s served in Germany, with no fewer than 15 squadrons of the 2nd Tactical Air Force. Its presence in England with 11 and 12 Groups was far more modest, although the 'week-end warriors' made up for that with 13 squadrons using the type until the RAuxAF was disbanded in 1957. Another area of operation was the Middle East with No. 32 Squadron operating from Nicosia and Shallufa, and the Far East where No. 60 Squadron 'blooded' the Vampire against terrorists operating from Tengah in Singapore.

Meanwhile, the third Vampire (MP838/G) had performed the first jet landings and take-offs from an aircraft carrier (HMS Ocean) on 3 December 1945. The Admiralty displayed interest in the type, issuing a specification to cover the production of 18 Vampires Mk 5 in 1947, eventually redesignated Sea Vampire F.20. The first of these (VV136) flew on 15 October 1948, which together with the other Vampires on order, were delivered to No. 702 Naval Air Squadron (NAS) at Culdrose and No. 787 NAS detached at St Davids. These navalised machines were fitted with a 'V'-shaped arrestor hook and enlarged air brakes and landing flaps. Further development in the form of the F.21 was short-lived; this envisaged wheel-less landings on the aircraft's belly over rubber-surfaced carrier decks, a solution soon found to be impracticable. Thus the Supermarine Attacker carried off the honour of being the first Fleet Air Arm (FAA) jet fighter to be operated from aircraft-carriers.

While the Vampire Mk 3 and Mk 5 had settled well into service at home and in Europe, those operating in hotter climes created uncomfortable problems for their crews. A Godfrey refrigeration unit to cool the cockpit was installed in the starboard air intake fillet, which was extended by some eight inches (200mm). In this form the Vampire was designated Mk 9, the first of which (WG848) built by English Electric at Preston was delivered in November 1951. There was also an upgrading of the powerplant to the Goblin 3 (3,500lb thust). These 'tropicalised' Vampires were initially operated by Nos. 28 and 60 Squadrons in the Far East as from January 1952, and later with other units in the Middle East and No. 8 Squadron based in Kenya.

With the appearance of the Venom FB1 in service, single-seat Vampires were relegated to training duties, mostly with Operational Conversion units (OCU).

VAMPIRE EXPORTS

A major export order for the Vampire came from Sweden on 9 February 1946, calling for the supply of 70 Mk Is. Designated J 28A, they were powered by a Goblin 3 engines licence-built by Svenska Flygmotor. These fighters went to form an entire Wing and in 1948 another massive order was placed for 310 Vampire FB50s under the designation of J 28B. Of these only 13 examples were built due to unfounded panic created by delivery problems of the indigenous SAAB J 29 engines. Three of Sweden's Vampires Mk I were passed on to Austria in 1955, while 25 others were sold to the Dominican Republic later that same year.

France received 30 F Mk Is between 1948 and 1950, followed by 94 ex-RAF Vampires FB Mk 5, by which time a licence for its production had been acquired by the Société Nationale de Constructions Aéronautique du Sud-Est: 67 examples from de Havilland-provided components, and 120 were built from scratch. Designated FB.51s, they were powered by a (Hispano-built) Nene 104B engine and varied considerably from the then standard Mk 5 in many respects; the type was known as the 'Mistral' in service.

Apart from TX807 already mentioned, Australia acquired TG431 (F Mk I) and VV465 (FB Mk 5) for evaluation purposes. Experience gained on these aircraft enabled the Commonwealth Aircraft Corporation (CAC) to produce the Nene-powered F.30, starting with

This 604 Squadron (Royal Auxiliary Air Force) pilot prepares for another sortie during summer camp at Ta' Qali, Malta, in June 1952 (R.J. Caruana)

A79-1 that was flown for the first time on 29 June 1949, followed by 55 others delivered by mid-1952. These went to Nos 75 and 76 Squadrons within No. 78 Wing (RAAF) which, in July of that year, moved to Malta from where they operated for close to three years utilising FB Mk 9s on loan from the RAF. With the introduction of the modified clipped wing, CAC produced a further 51 examples, designated F.31 (28 of which started life as F.30s). Single-seat Vampires remained in service 'down-under' until 1961, although most had been on target-towing duties since 1956.

Canada requested 150 Vampires F Mk 3, eventually reducing the order to 85, all of which were supplied ex-RAF stocks. Deliveries began in September 1947 serving with Nos. 410 and 421 Squadrons, Royal Canadian Air Force (RCAF). In 1960, 15 of these Canadian Vampires were acquired by Mexico where they became known as 'Avocados' due to their overall green colour scheme!

Norway ordered 20 Vampire F Mk 3s in 1948, soon followed by a further order for 36 FB.52s, where they operated with front-line units until 1957.

Through an agreement signed in October 1949, Italy obtained five FB Mk 5s and 51 FB.52s, together with a production licence for 150 examples to be built by Fiat and Macchi. First 'jet' units of the Aeronautica Militare Italiana (AMI) were 79 and 81° Squadriglie (6° Gruppo, 4° Stormo), based at Naples, in August 1951. Egypt found a way of bypassing a UK embargo on arms by acquiring its Vampires from Italy; over 50 ex-Italian Air Force FB.52s were refurbished by Macchi at Varese and delivered as from 1956, while 45 new examples replaced them in Italian service.

Another large foreign user of the Vampire was India. Of the 286 FB.52s ordered, Hindustan Aeronautics Ltd (HAL) built all but 39 examples under licence. Deliveries from the UK started towards the end of 1948. The first HAL production machine flew in February 1952, and by the early 'sixties the type was in service with 16 squadrons of the Indian Air Force.

Other FB.52s went to New Zealand in 1950 (18, followed by 21 ex-RAF FB Mk 5s in 1956), Finland in 1953 (six), Lebanon in 1954 (six), Iraq in 1955 (12), Jordan in 1956 (seven from Egypt, joining 10 ex-RAF Mk 9s already in service), Saudi Arabia in 1957 (30 ex-Royal Egyptian Air Force) and Syria (numbers imprecise, but probably around 20). Other versions acquired by foreign users included Rhodesia's 16 FB Mk 9s, South Africa (10 FB Mk 5s, 10 FB.52s, 30 FB Mk 9s) and Venezuela (24 new-build FB Mk 5s in 1949).

Although out of chronology, Switzerland's use of the Vampire deserves special mention as it was the longest, spanning some 45 years. Three F Mk Is were acquired for evaluation in July 1946. This led to an order for 75 Vampires FB Mk 6 toward the end of 1948 with deliveries starting in April of the following year. Before delivery of this batch had been completed, a licence to produce a further 100 examples had been granted by de Havilland to the Federal Aircraft Works at Emmen. With the introduction of the Venom into service in the interceptor role, the single-seat Vampires regained their original task as fighter-bombers after receiving a major upgrade. This included a fully pressurised cockpit and the installation of a Martin Baker Mk 2 ejector seat. Further modifications were undertaken in the early 'seventies including a reprofiled nose section housing upgraded avionics and UHF radio. 59 Swiss single-seat Vampires were still in service when the type was officially retired on 12 June 1990, to the joy of museums and collectors around the world.

Whoever had the opportunity to fly a Vampire had nothing but praise for its outstanding handling qualities, lightness of controls and forgiving manner – the latter a very rare attribute in jet aircraft. It was built in greater quantities than any other post-war British fighter, and introduced the jet-age to air forces around the world. Some had survived in museums and collections well before Switzerland flooded the market when it retired the type from service, hopefully ensuring that the Vampire would be seen flying for quite a few years to come.

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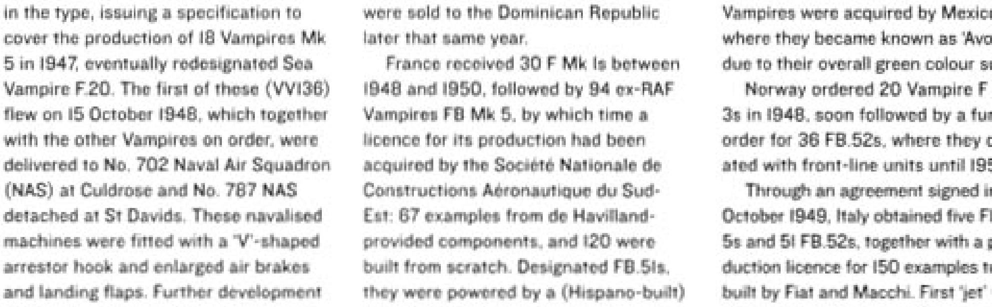
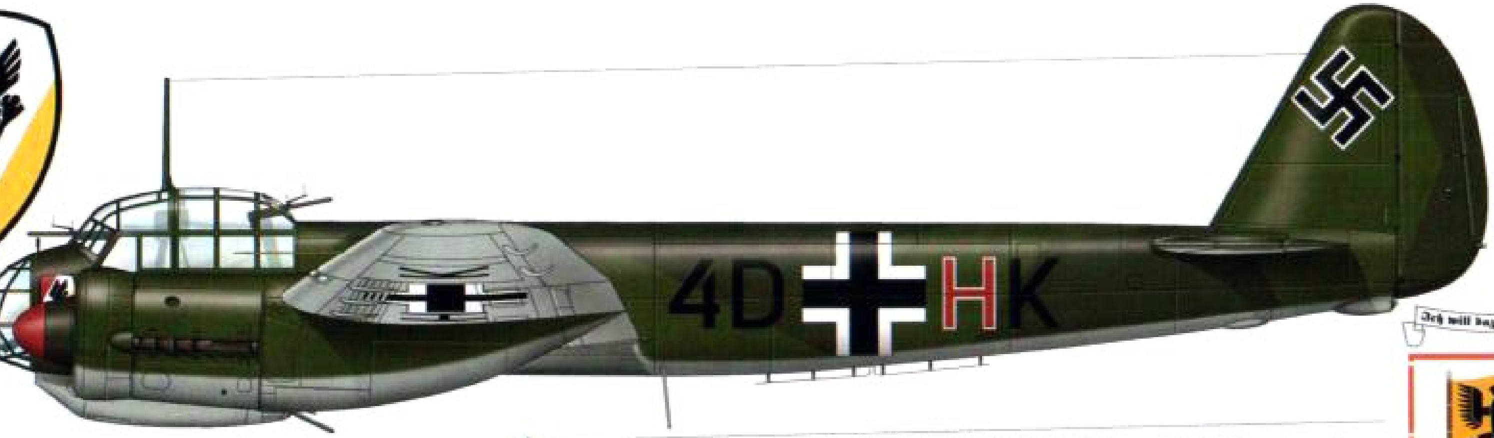
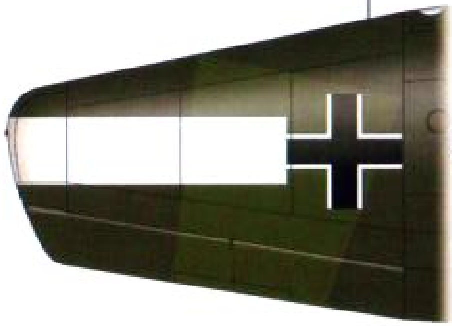
Malta was extremely popular for summer camps by Royal Auxiliary Air Force squadrons until their disbandment. Here Vampires of No.601 Squadron are seen at Ta' Qali in June of 1952, with Mtarfa and its landmark clock in the background (R.J. Caruana)

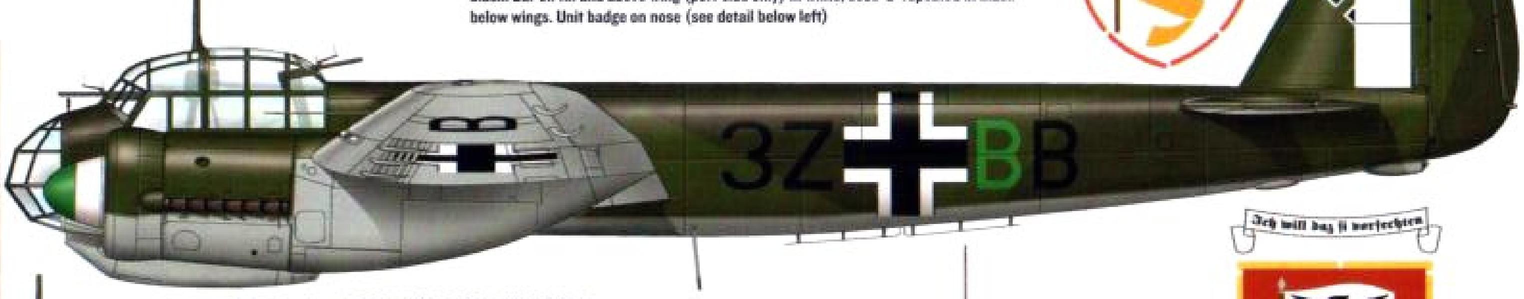




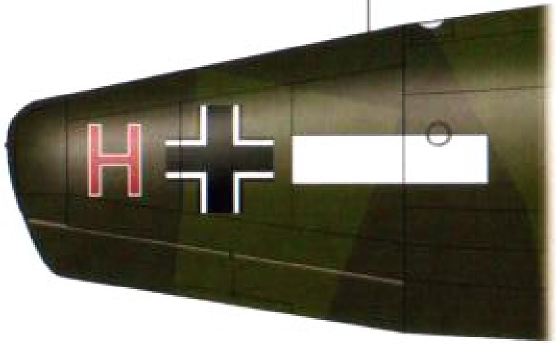
Left: Junkers Ju 88A-1, 4D+HK, KG 30, operating from Norway, 1940. RLM70/71/65 finish with Rot 23 front of spinner and code 'H', the latter thinly outlined in white; remainder of code in black with H+K repeated below the wings. Unit badge on nose

Below: Junkers Ju 88A-1, W/Nr. 4136, 3Z+BB, I Gruppe Stab/KG77, France, September 1940. RLM70/71/65 finish with green/white spinner; code 'B' in green, rest of code in black. Bar on fin and above wing (port side only) in white; code 'B' repeated in black below wings. Unit badge on nose (see detail below left)





Below: Junkers Ju 88A-1, W/Nr. 7112, 3Z+HN, 5./KG77, France, September 1940. RLM70/71/65 finish with Rot 23 spinner front and code 'H', the latter outlined in white; rest of code in black. Bar on rudder and above port wing probably in RLM 02; code 'H' repeated in red/white above wingtips and in black below. Unit badge on nose (see detail below left)



1:72 Scale

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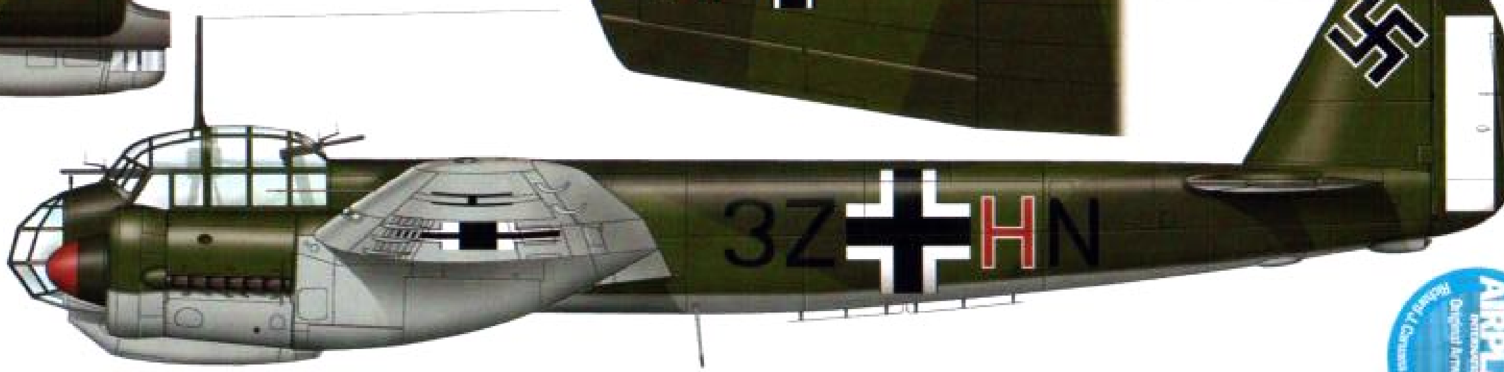
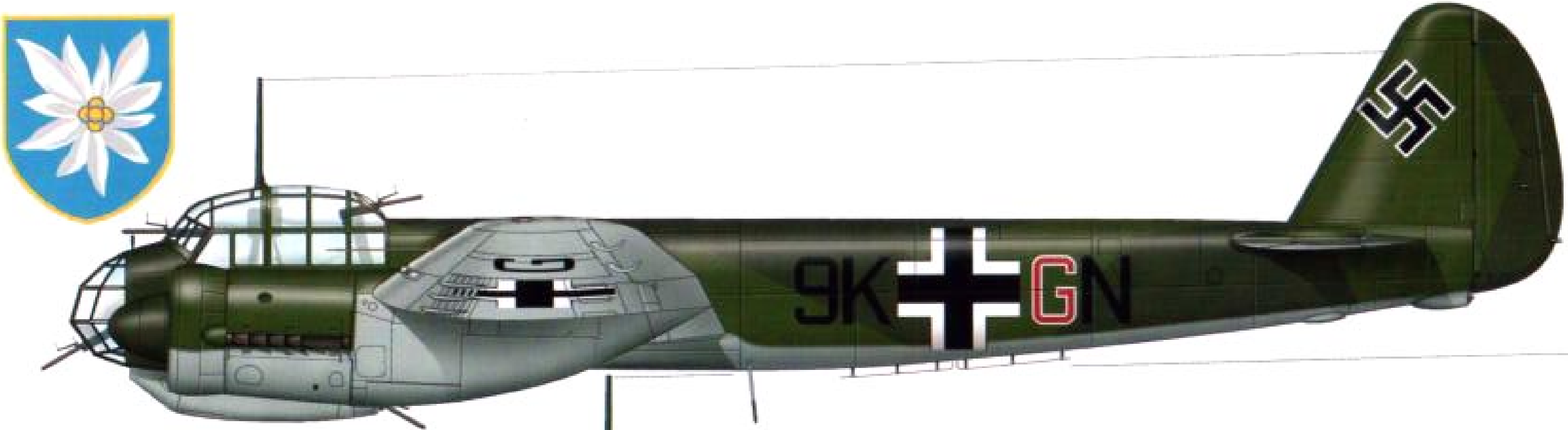
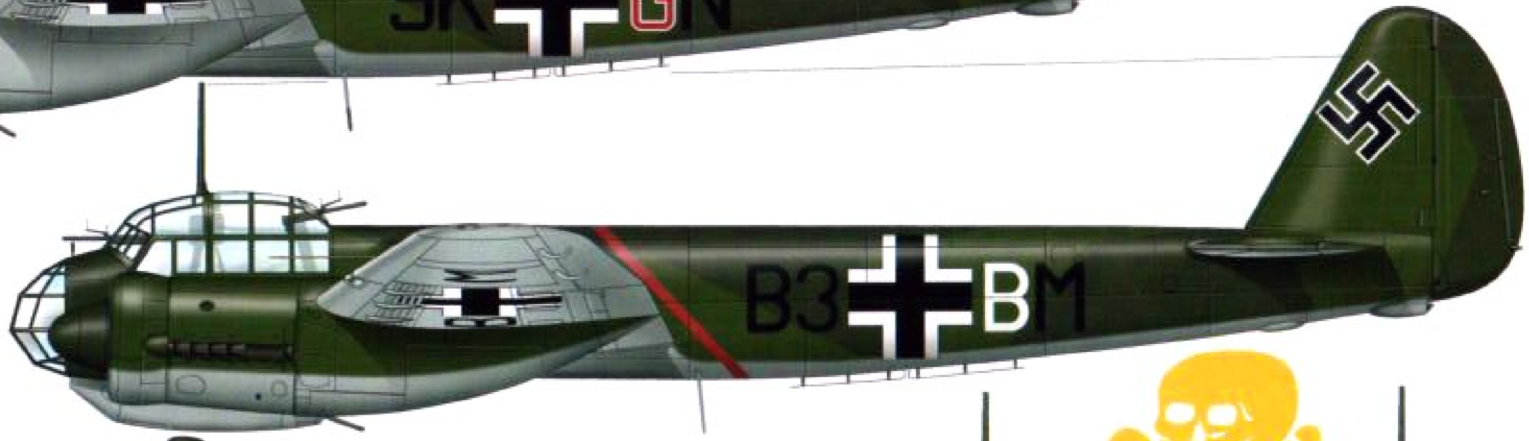
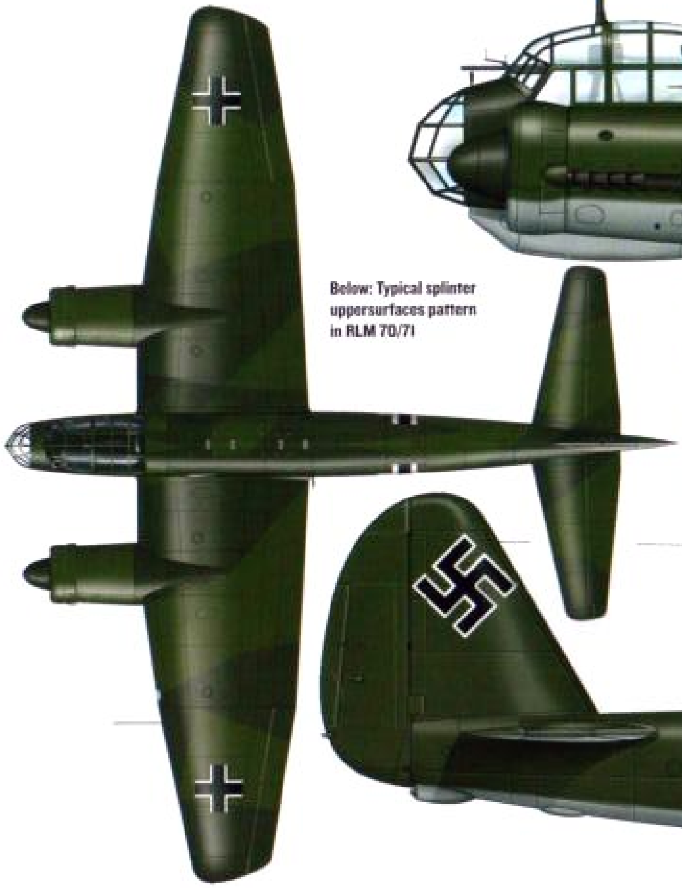


Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2009



Left: Junkers Ju 88A-1, 9K+GN, 5./KG 51, France, summer 1940. RLM 70/71/65 finish with code 'G' in Rot 23, outlined in white; unit badge on nose

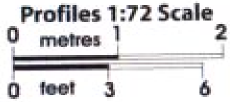




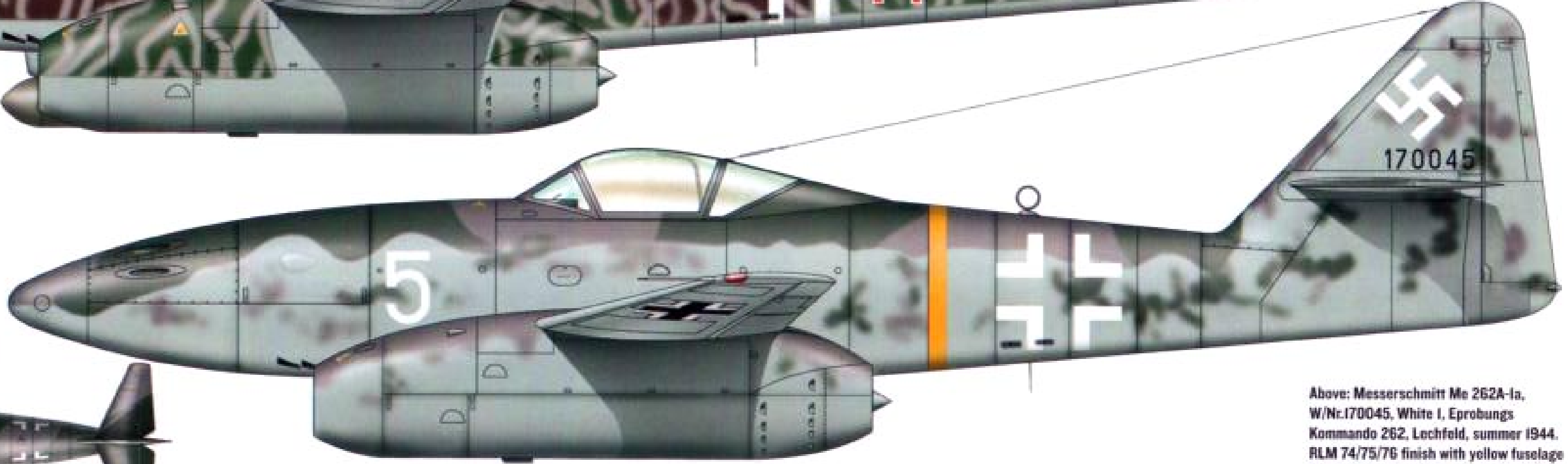
Below: Typical splinter uppersurfaces pattern in RLM 70/71

Above: Junkers Ju 88A-1, B3+BM, 4./KG 54, France, late summer 1940. RLM 70/71/65 finish with Rot 23 angled band around fuselage; codes in black and white, with 'B+M' repeated below wings. Unit badge on nose (See detail at right)

Below: Junkers Ju 88A-1, 9K+AL, (3 Staffel) I./KG 51, Paris-Orly, 1941. Non-standard RLM 70 upper surfaces with RLM 65 undersides; Gelb 04 spinner and 'A' of code. Unit badge on nose (see detail far right); white cowling front and underside of wingtips



Messerschmitt Me 262A-1a/Jabo, W/Nr.110571, 9K+HN, flown by Fw. Witzmann of 5./KG(J) 51. RLM81/82/76 with RLM 02 wavy pattern on top surfaces; Rot 23 'H' outlined in white. Note bombs in ventral position and upper gun throughs covered over



Above: Messerschmitt Me 262A-1a, W/Nr.170045, White 1, Eprobungs Kommando 262, Lechfeld, summer 1944. RLM 74/75/76 finish with yellow fuselage band and white '5' on nose; W/Nr. in black, swastika in white. Standard national markings

Typical Me 262 uppersurfaces pattern in RLM 74/75

Left: Messerschmitt Me 262A-1a, W/Nr.110400, White 8, flown by Maj. Walter Nowotny, Kommando Nowotny, Achmer, winter 1944. RLM81/82/76 finish with Gelb 04 fuselage band and air intakes; white '8' on forward fuselage. Black W/Nr. on fin; standard national markings

PROFILES 1:48 Scale

0 metres 1 2

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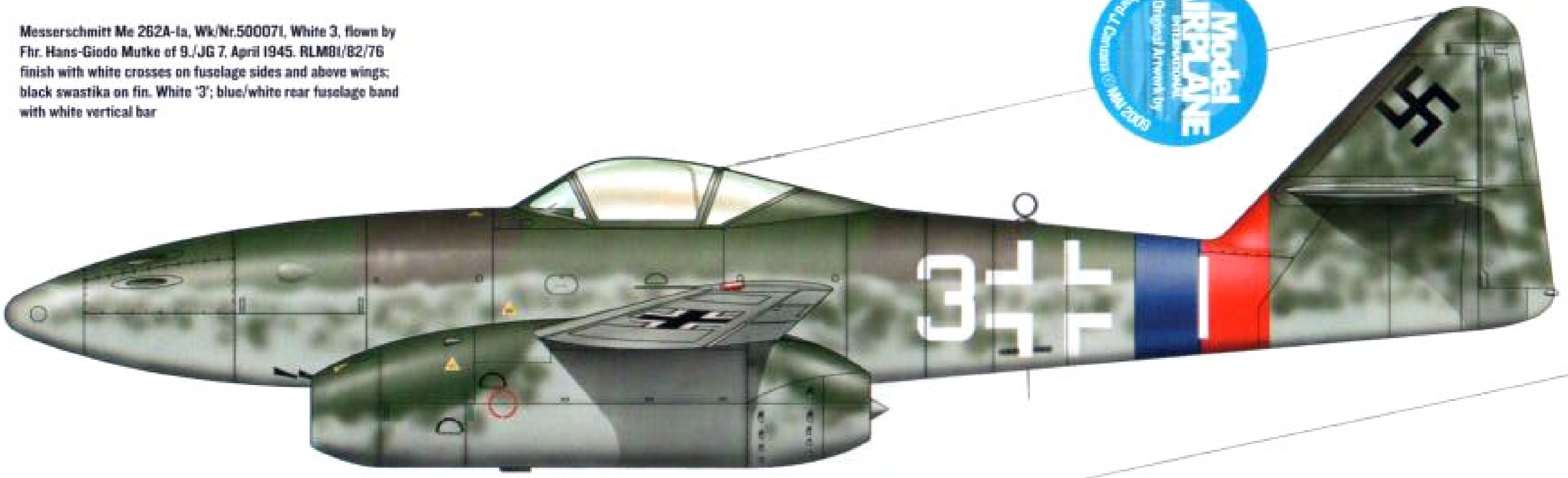
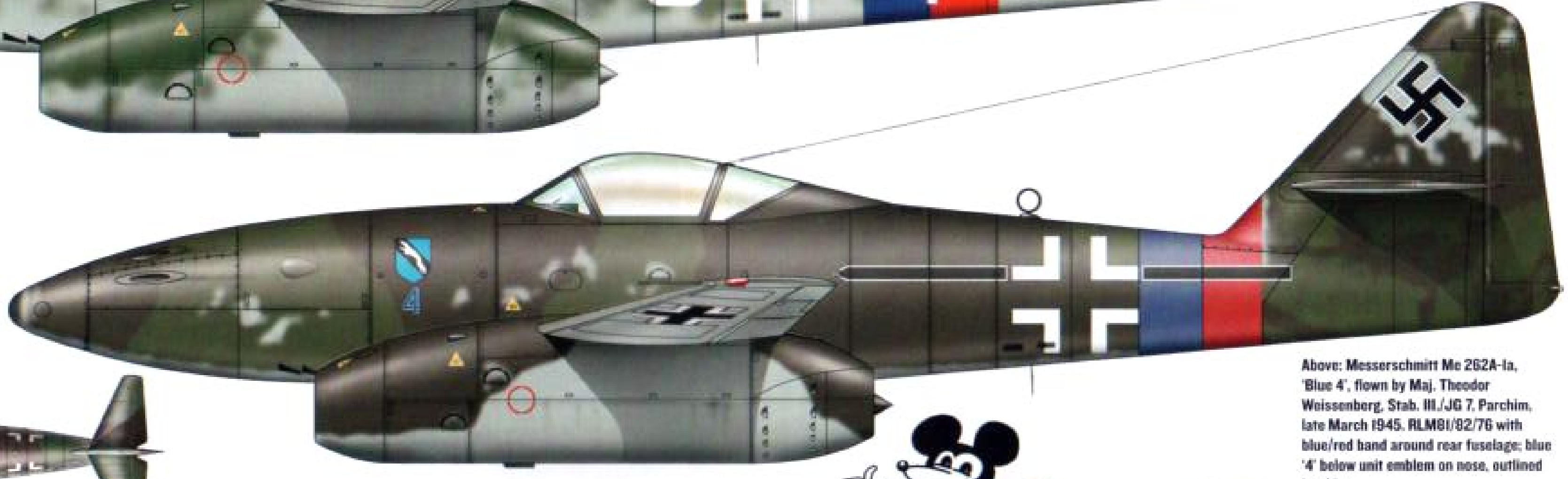
Messerschmitt Me 262A-Ia, Wk/Nr.500071, White 3, flown by Fhr. Hans-Giodo Mutke of 9./JG 7, April 1945. RLM81/82/76 finish with white crosses on fuselage sides and above wings; black swastika on fin. White '3'; blue/white rear fuselage band with white vertical bar

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2009





Typical Me 262 uppersurfaces pattern in RLM 81/82

Above: Messerschmitt Me 262A-Ia, 'Blue 4', flown by Maj. Theodor Weissenberg, Stab. III./JG 7, Parchim, late March 1945. RLM81/82/76 with blue/red band around rear fuselage; blue '4' below unit emblem on nose, outlined in white

Left: Avia S.92.2, V-36, Czechoslovak Air Force, 1947. Olive Green overall with black codes; national marking, edged in blue, in six positions. Mickey Mouse emblem on forward fuselage

PROFILES 1:48 Scale

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HISTORICAL FEATURE

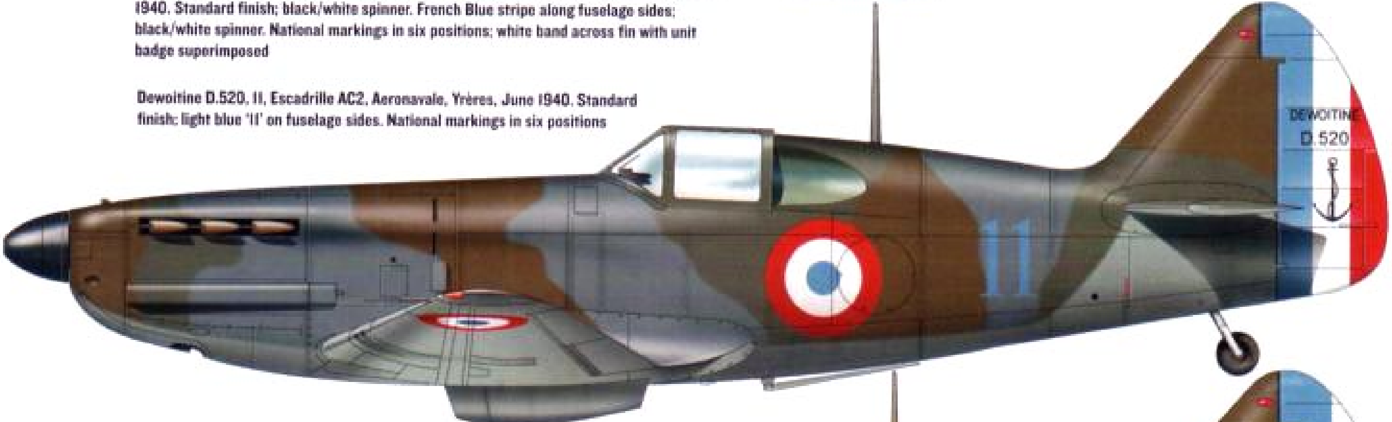
DEWOITINE D.520

Dewoitine D.520, No.273, flown by Adjutant-Chef Denis Ponteins, 4th Escadrille GC II/7 (Spa.7 Escadrille 'France'), May 1940. Standard finish of Vert Foncé/Terre Foncé/Gris Bleu Foncé upper surfaces and Gris Bleu Clair undersides; '3' in white, spinner in red. National markings in six positions; 'sharkmouth' motif below nose in black with white teeth, outlined in red

Dewoitine D.520, No.94, flown by Sgt Rigalleau, 1st Escadrille, GC I/3, France, 1940. Standard finish; national markings in six positions. Light blue '14' with white drop shadow on fin; unit badge on fuselage sides

Above: Dewoitine D.520, flown by Adj. Chef Marie Emile Leblanc, GC III/3, Relizanne, June 1940. Standard finish; black/white spinner. French Blue stripe along fuselage sides; black/white spinner. National markings in six positions; white band across fin with unit badge superimposed

Dewoitine D.520, II, Escadrille AC2, Aeronavale, Yrères, June 1940. Standard finish; light blue 'II' on fuselage sides. National markings in six positions



Dewoitine D.520, No.139, damaged in transit at Douala, Camroon, 1940. Standard finish; national markings in six positions. Red Cross of Lorraine, outlined in white, on fuselage sides

PROFILES 1:48 Scale

DEWOITINE D.520

Displaying pleasing lines and a solid lineage of previous fighters from Dewoitine, this vibrating aircraft arrived in very few numbers and too late to turn the tide of battle in France during those fateful months of spring 1940

Had the D.520 entered production in time to form the backbone of the Armée de l'Air fighter units, Luftwaffe fighters would probably have had a much more difficult time in achieving air superiority during the Battle of France. So much so that after the debacle the D.520 managed to hold its own ground during comparative trials againts the Messerschmitt Bf 109E-3.

Emile Dewoitine's line of fighters has its roots in the D.101 of 1921 and can be traced all the way through to the D.510 of 1934. One thing these fighters had in common was that they retained a distinguished air of elegance about them. On 13 July 1934 the Air Staff of the French air force issued a call for the eventual replacement of the D.510 that together with the D.500 and D.501 equipped the majority of French fighter units. Dewoitine's first effort, the D.513, was unfortunately somewhat of a disappointment and certainly inferior to its direct competitor, the Morane-Saulnier MS.406.

In June 1936 Dewoitine formed a private design office, with Robert Castello as chief designer, and immediately set himself the task of producing a fighter around the 900hp Hispano-Suiza 12Y21 engine with a projected speed of 500km/h (312mph). This design was, once again, rejected by the Service Technique Aéronautique (STA) on the insistance that the new fighter had to have a top speed of 520km/h. Taking the target speed as the project number, the D.520 was born in November 1936 as a private venture, with no official specification guiding the design group. In January 1937 the A.23 technical programme was launched by the French authorities, though the STA did not order any prototypes of Dewoitine's fighter even though it appeared that it was well within the requirements.

Dewoitine D.520 No. 143 in the markings of the 4th Escadrille, Groupe de Chasse GC.II/7, during the unit's transfer from Syria to French North Africa in preparation for Operation Torch, when Vichy French pilots had to face their own countrymen forming part of the Allied forces. Note tail of Savoia Marchetti S.79 in the background (R.J. Caruana Archives)

DEVELOPMENT

Undaunted, Emile Dewoitine proceeded with his project, probably strengthened by the fact that in March 1937 his establishment had been incorporated into the Société Nationale de Constructions Aéronautiques du Midi (SNCAM). Detail design led to the construction of a test cell late in 1937. His perseverance was awarded official recognition when on 2 April 1938 the Air Ministry awarded him a contract for the construction of a prototype, when this was not far from completion.

First flight of the D.520-01 was performed at Toulouse-Francazal on 2 October 1938 at the hands of Marcel Doret, a pilot who was to carve his name in the annals of the Free French Air Force in later years. Results of this, and other early flights, were not very encouraging. Though possessing very clean lines, the Hispano engine did not offer enough power, and the twin radiators caused excessive drag; their inefficiency, moreover, brought engine temperatures to dangerously high levels. It did not live up to its designation, either, as top speed was only 480 km/h. On 28 November the prototype suffered a belly landing; though not extensively damaged, this gave the designers an opportunity to install a 12Y29 engine providing 1,200hp. Engine coolants were grouped in a single belly radiator and the design speed was, finally, attained.

A second prototype (D.520-02) joined the development programme in January 1939, differing mainly in having an enlarged fin and rudder, a rearward sliding canopy; provisional armament installation consisted of one Hispano HA.404 20mm cannon firing through the propeller spinner and a machine gun in a gondola under each wing. During later flights this aircraft clocked 527 km/h though its real potential emerged when it was re-engined with the 12Y31 with which it attained 550 km/h at 5,200m with a climb to 8,000m taking 12 minutes 53 seconds. D.520-03 took to the air on 15 March – again flown by Doret – and it is interesting to note that this machine was evaluated by a Belgian Air Force delegation that displayed an interest in licence production of the type. Attempts were also made to acquire the Daimler-Benz DB.601 for the D.520. Both Belgian and German connections failed to materialise.

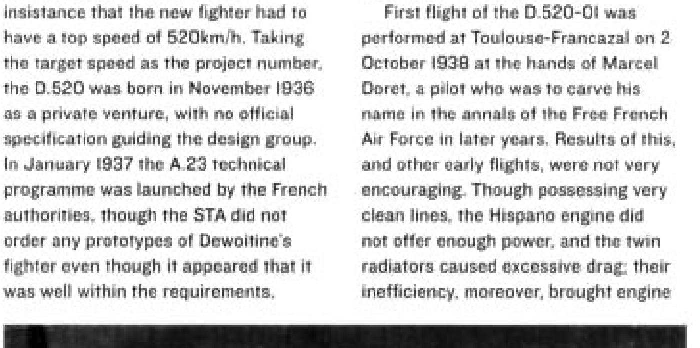
On 17 April 1939 a contract for 200 D.520s for the Armée de l'Air was confirmed, to be powered by a 12Y31 engine that was later changed in favour of the 12Y45. The latter incorporated a Szydlowsky-Planiol S39-H3 supercharger. As it turned out, the initial delivery of production D.520s for the period of September-December of the same year turned out to be overly optimistic! In fact, the first machine did not fly until November, with a second example flying on 3 December.

In June orders were boosted by a further 600 (later cut down to 510) and on the outbreak of war on 12 September 1939 orders were brought up to a total of 1,280, with a projected production schedule of 200 aircraft per month. Orders continued to pile up: 120 machines for the Aéronavale in January 1940 followed by an air force request to take the total up to 2,200 with a scheduled production rate of 350 per month as from November of that year; a clear indication that in the D.520 the French authorities had recognised, albeit too late, a real winner.

Production machines differed mainly in a 51cm (20in) extension of the fuselage, redesigned engine cowling panels, the addition of armour plate behind the pilot's seat and the installation of the machine guns within the wing.

BLITZKRIEG

On 10 May 1940 the 'Phoney' War' became for real in more ways than one. To begin with, only 79 D.520s of the 250-odd produced by that time had reached French operational units, though only Groupe de Chasse (GC) I/3 had become anywhere near operational, with 36 of the new fighters. In the first three days MS.406s had to bear the brunt of Luftwaffe attacks - and fell like flies. They were clearly no match for the Messerschmitt fighters. GC.I/3 was rushed into action on 13 May with some success as three Hs 126s and a He 111 were claimed for no losses of their own. The following day two D.520s were lost for a confirmed tally of 10 enemy aircraft. Other units to



A D.520 that appears to be in the middle of receiving the red/yellow stripes, typical of the Vichy Air Force operating in North Africa. Those on the fin and tailplane have already been applied while the nose is painted yellow, awaiting the application of the red stripes (R.J. Caruana Archives)

Dewoitine D.520, No.105/I, flown by Commandante Bernard Challe, 2nd Escadrille, GC I/3 based at Oran La Senia (Algeria), late 1940. Standard finish of Vert Foncé/Terre Foncé/Gris Bleu Foncé upper surfaces and Gris Bleu Clair undersides; white arrow along fuselage sides. National markings in six positions, those on fuselage outlined in white; white disc on fin with red 'I'. Unit badge on fuselage sides

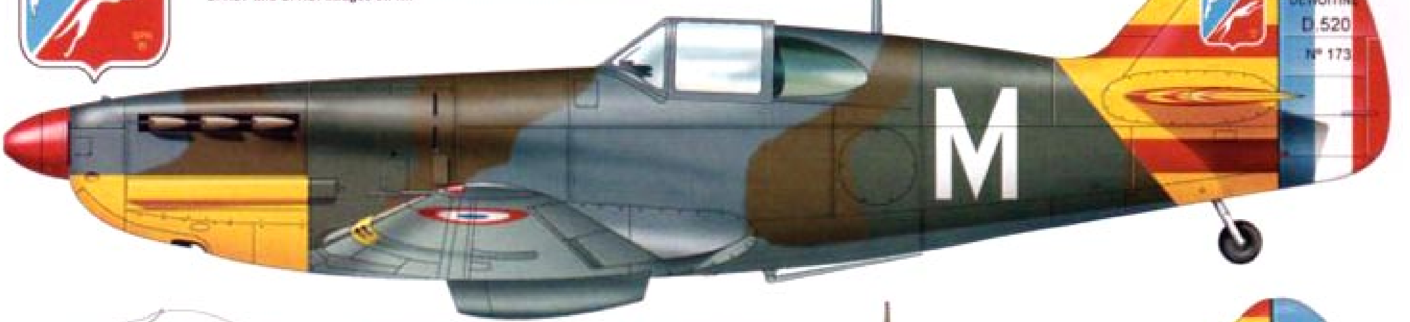
Dewoitine D.520, No.38/3, flown by Lt René Lété, 3rd Escadrille, GC II/3, Homs (Syria), June 1941. Standard finish; yellow rear fuselage and spinner. French Blue stripe along fuselage sides; white '3'. National markings in six positions, those on fuselage outlined in white; unit badge on fin

Dewoitine D.520, No.129/24, GC III/6, Vichy Air Force, Syria, 1941. Standard finish; red/yellow bands around nose and rear fuselage. White '24' on fuselage sides; tricolour angled chordwise bands around wings. Red spinner; unit badge on fin

Dewoitine D.520, 'II', IAC Escadrille Aeronavale, North Africa, March 1941. Standard finish. white arrow along fuselage sides, front of spinner, 'II' on fin and outline of fuselage roundel. Standard roundels in four wing positions; unit badge aft of cockpit

Dewoitine D.520, No.277/6, flown by Adjutant Pierre le Gloan (who ended the war with 22 victories), 1st Escadrille of GCIII/6, Syria, 15 June 1941. Standard finish; yellow spinner and rear fuselage. White arrow along fuselage sides; national markings in six positions, those on the fuselage outline in white. White '6', thinly outlined in black, on rear fuselage over an angled tricolor ribbon. Unit badge on fin

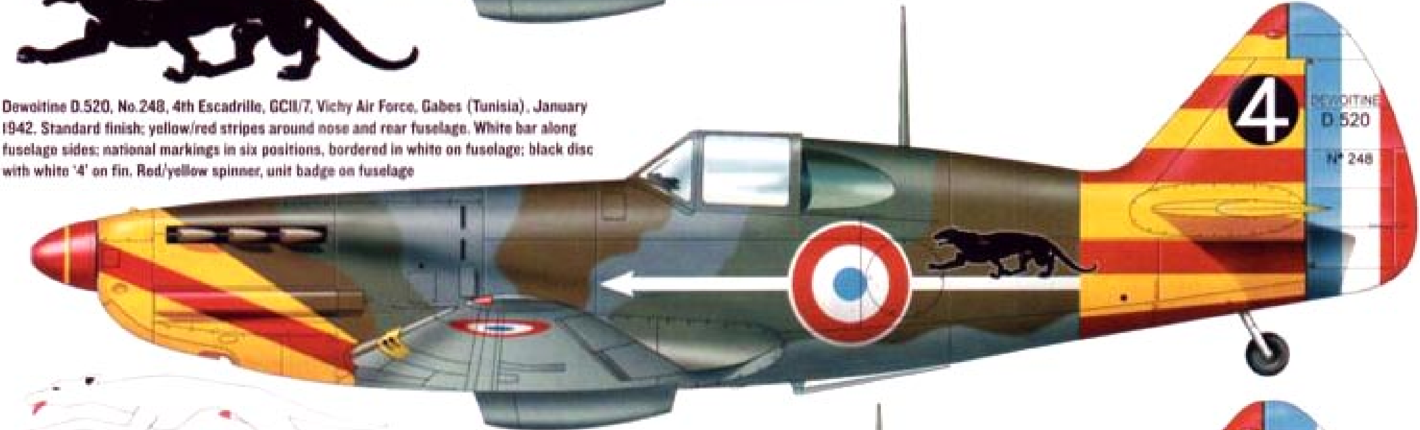
PROFILES 1:48 Scale

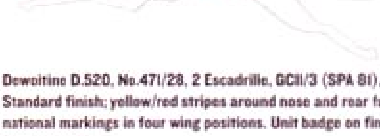


Dewoitine D.520, No.173/M, flown by Commander Jule Morlat, GC II/3, Alep-Nerab, summer 1941. Standard finish of Vert Foncé/Terre Foncé/Gris Bleu Foncé upper surfaces and Gris Bleu Clair undersides; red/yellow rear fuselage, yellow ventral half of nose. Red spinner, white 'M'; national markings in four wing positions. Combined SPA37 and SPA81 badges on fin

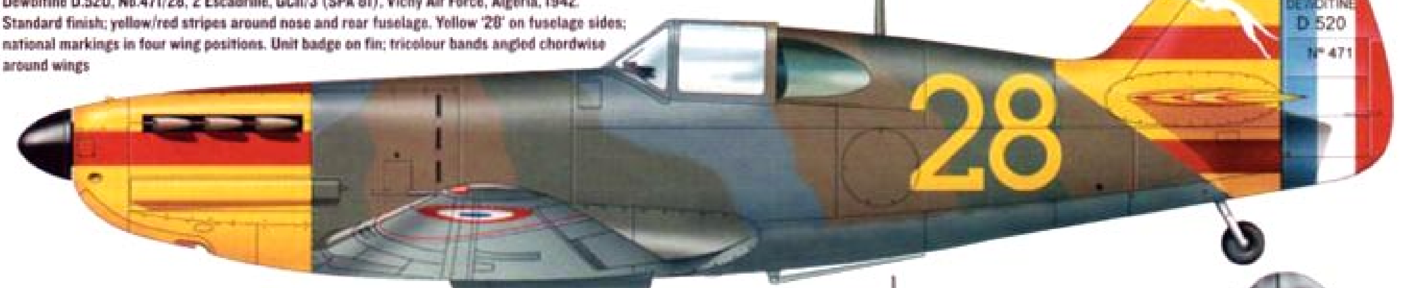
Dewoitine D.520, No.415/8, 1st Escadrille, GC I/2, Vichy Air Force, Chateauroux, 1942. Standard finish; red/yellow stripes around nose and rear fuselage. White bar and '8' on fuselage sides; national markings in six positions, those on fuselage outlined in white. Unit badge on forward fuselage

Dewoitine D.520, No.248, 4th Escadrille, GCII/7, Vichy Air Force, Gabes (Tunisia), January 1942. Standard finish; yellow/red stripes around nose and rear fuselage. White bar along fuselage sides; national markings in six positions, bordered in white on fuselage; black disc with white '4' on fin. Red/yellow spinner, unit badge on fuselage

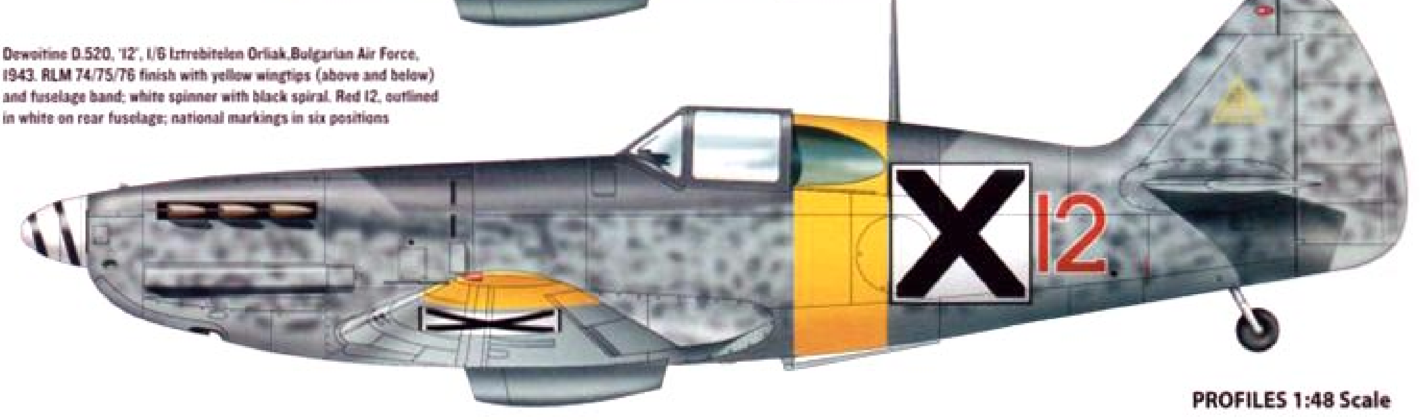




Dewoitine D.520, No.471/28, 2 Escadrille, GCII/3 (SPA 81), Vichy Air Force, Algeria, 1942. Standard finish; yellow/red stripes around nose and rear fuselage. Yellow '28' on fuselage sides; national markings in four wing positions. Unit badge on fin; tricolour bands angled chordwise around wings



Dewoitine D.520, '12', 1/6 Iztrebitelen Orliak,Bulgarian Air Force, 1943. RLM 74/75/76 finish with yellow wingtips (above and below) and fuselage band; white spinner with black spiral. Red 12, outlined in white on rear fuselage; national markings in six positions



PROFILES 1:48 Scale

One of the Dewoitines D.520 that the Regia Aeronautica acquired from Luftwaffe stocks, seen during a refuelling stop at Istres on its flight from Montelimar to Reggio Calabria in February 1943. French resistance members working overtly within official circles sabotaged technical information passed on to Italian pilots giving them a hard time to get used to their new mounts! (R.J. Caruana Archives)

form on the new fighter and enter the fray during this hectic period were GC II/3, GC II/7, GC III/3 and GC III/6.

GC III/6 was the last to debut on 13 June. Three days earlier Italy had entered the war on the Axis side and this unit faced the Regia Aeronautica with a score of five victories, though two of its machines were lost on the ground during a strafing attack. During the short two-month campaign, during which the D.520 attempted desperately to defend French airspace, 85 of these fighters were destroyed; 44 of their pilots lost their life. The surviving men and 175 machines, together with naval Escadrille AC-1 (AC-1, 2, 3, and 4 had received a total of 52 machines around June 22-24) flew to North Africa. At the date of the Armistice (25 June) a total of 437 D.520s had been completely finished, of which 402 had been delivered to the Armée de l'Air and Aéronavale. Apart from the 35 undelivered machines, there remained in unoccupied France a further 153 machines. Three D.520s sought refuge in Britain where together with six Hurricanes Mk I formed the Free French Air Force 1st Fighter Group at Odiham on 29 August 1940.

VICHY AIR FORCE

A restricted air arm was allowed by the German occupation forces to the French Vichy government, comprising 14 Groupes de Chasse and three Escadrilles together with two Escadrilles for the Aéronavale. In April 1941, it was also agreed that over a thousand aircraft were to be built in unoccupied French territory, mainly from components or materials already on the production line, though even new-build machines were eventually constructed. Of these, 550 were D.520s ordered at the Société Nationale de Constructions Aéronautique du Sud-Est (SNCASE) of which SNCAM now formed part. The intention was that the D.520 was to equip all Vichy fighter units, replacing any other fighter type then in service.

By June a number of D.520-equipped units were in action against the Royal Air Force (RAF) in Syria, particularly those of GC III/6 and II/3 opposing Hurricanes, Gladiators and Tomahawks. This appears to have been an even battle, as 31 RAF machines were claimed for the loss of 32 D.520s, before French units moved to French North Africa. Between 8 and 10 November – the Allied landings in North Africa (Operation Torch) – French pilots were pitted against each other on both sides with tragic losses. Vichy forces lost 19 D.520s while 16 of the same type were lost from the Allied side.

IN FOREIGN MARKINGS

The state of affairs in North Africa infuriated the Germans, who took over the previously unoccupied areas of France and on 27 November formally dissolved the Vichy Air Force, confiscating all aircraft in its inventory. These included 246 D.520s on the field and a further 169 still in various stages of construction at the Toulouse plant. Moreover, the Luftwaffe ordered 150 new examples, materials for which had already been either allocated or even cut and found to be at various stages of production.

These Luftwaffe machines were distributed among training units, starting with JG 105 that had taken over Chartres and other airfields around Paris as operational bases. Also partly equipped were JG 101 and JG 103. Early in 1944 JG 101 under the command of the famous Luftwaffe ace Walter Nowotny had D.520s flying alongside the unit's Fw 190s at Pau-Long, while JG 103 similarly equipped was based at Zeltweg in Austria. Although it was highly praised by experienced pilots, the D.520 was no mount for beginners and losses were particulary high.

The Regia Aeronautica had captured some examples as early as the summer of 1940 – war booty for having 'participated' in the final throes of the Battle of France. A further batch of 60 was received from captured Luftwaffe stocks in February 1943. These were ferried from Montelimar to Italy in three groups on February 20, 23 and 27 respectively. Some of these still bore French Escadrille markings, such as the running skeleton of GC II/1. The D.520s went to equip second line units, sporting broad wide white bands around the wings denoting their training role. On 15 June 1943 a smaller group of seven brand new D.520s from the Toulouse plant, complete with their Luftwaffe-style finish of RLM 74/75/76, went to replenish the 151° Gruppo Autonomo based at Reggio Calabia. British soldiers of the York Regiment captured some survivors of these D.520s (in dilapidated condition) on 4 September 1943, just four days prior to Italy's capitulation.

Of the120 D.520s ordered by Bulgaria, 96 examples began to arrive in September 1943 where they were assigned to the 1st and 2nd fighter groups of the 6th Air Force, with the 3rd being similarly equipped later on. These fighters made their operational debut on 10 December of the same year, intercepting a force of 9th Air Force (USAAF) B-24 Liberators, escorted by P-38 Lightnings. The first D.520 kill was registered on 20 December when a P-38 was shot down. In January 1944 Bf 109s began to arrive in Bulgaria to replace the French fighters, although these were too few to face the ever-increasing Allied raids and the D.520s remained in service, albeit suffering great losses at the hands of P-38s and P-51 Mustangs and were withdrawn from front line service towards the end of April 1944.

FREE FRANCE

Opportunities missed by the Dewoitine D.520 in the defence of France during the spring of 1940 were somewhat redressed when four years later the south-west of the country was liberated. A Free French fighter Groupe was formed under the leadership of Marcel Doret, Dewoitine's former test pilot, flying recaptured D.520s. Groupe Doret was formed on two Escadrilles within the Forces Francaises de l'Interieur, one based at Tarbes-Ossun, the other at Toulouse. In December these were re-formed into GC II/18 'Saintonge' and as from 1 March 1945 the unit was equipped with Spitfires, the Dewoitines passing onto GCB I/18 'Vendée' to complement their existing Dauntlesses. All in all, about 55 D.520s were recovered.

In conjunction with other units, the D.520s served to pin down German troops and material trapped in Atlantic ports, through continuous attacks that continued till the end of the war. This was not the end of the D.520's career, however, as a small group (about 17) formed part of No. 704 pilot training school at Tours in June 1946, where a two-seat conversion was experimentally produced. This received official sanction and 20 other machines that were being overhauled at the time by l'Atelier Aéronautique de Colombes were ordered as D.520DC (double commande), although only 12 are known to have been so converted. On August 31, 1947, the school at Tours relinquished these D.520s and passed them onto the Cazaux fighter school.

The Escadrille de Présentation de l'Armée de l'Air No. 58 was re-equipped with seven Dewoitine fighters (three of which were two-seaters) after they relinquished their Yak-3s in July 1948. Little use of these aircraft could be made, as most of the time they suffered from low serviceability. They struggled on until 3 September 1953, however, the day that marks the last recorded flight of the D.520 in service.

A brilliant little fighter by all means, but one whose career was overcome by events independent of its own merits. Luckily more than one example have survived up to our time, which is more than can be said of other types which enjoyed wider use. The little Dewoitine D.520 managed to regain some of the waning prestige brought about by a blinkered pre-war official French policy towards its armed forces. One has to admit that this reflected the policy of many contemporary European nations who believed that between 1914 and 1918 they had fought the war to end all wars. ■

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Dewoitine D.520, SV-GB (No.544), Jagdschulegeschwader JG103, Luftwaffe, based at Paris Le-Bourget, France, 1944. RLM 76 fuselage sides with RLM 74 upper surfaces and Gelb 04 undersides; national markings in six positions. Code in black; spinner divided into black and white halves

Dewoitine D.520, '6', ex-GC I/7 Armée de l'Air captured and painted in Italian markings as seen during its ferry flight from Montelimier in February 1943. Vert Foncé/Terre Foncé/Gris Bleu Foncé upper surfaces and Gris Bleu Clair undersides; all French markings painted over and fasces marking in black applied in four wing positions. White fuselage and wing (chord-wise) bands; original French rudder markings modified into a white cross. '6' in white with black drop shadow on fuselage sides; GC I/7 marking in white below cockpit

Dewoitine D.520, No.510, 164-6, 164° Gruppo Autonomo, Regia Aeronautica, Reggio Emilia, May 1943. Standard French finish; black fasces markings in four wing positions. White fuselage band and cross on rudder; all lettering in black

Dewoitine D.520, 371ª Squadriglia, 161° Gruppo Autonomo, Littoria (Latina), May 1943. Verde Oliva Scuro 2 upper surfaces with Grigio Azzurro Chiaro I undersides; white cross on fin and fuselage band. '371' in black; fasces markings in four wing positions in black

Dewoitine D.520, 82ª Squadriglia, 13° Gruppo C.T., 2° Stormo, Torino-Caselle, spring 1943. An ex-Luftwaffe machine finished in RLM74/75/76 with white spinner, fuselage band and cross on vertical tail surfaces; '82' in black. German markings overpainted using Italian colours; fasces markings in four wing positions in black

PROFILES 1:48 Scale

Thanks
G-BIRH belongs to the Banbury Gliding Club based at Hinton in the Hedges airfield, and grateful thanks to John Giddins for permission to photograph his aircraft. G-OFER belongs to Mary Meagher and is based at Shennington Gliding Club, grateful thanks to Mary & Alan for their permission and assistance in obtaining the photographs. G-OOMF belongs to Robert & Caroline Bell and is based at Enstone Airfield, grateful thanks to Gary & Alan for their permission and assistance in obtaining the photographs.

All photographs Paul Morrison 2008

1:1 REFERENCE

Piper PA-18 Super Cub

The tailwheel assembly on the glider-towing machine

The rocker arm control linkage for the elevators visible through this clear panel in the vertical fin

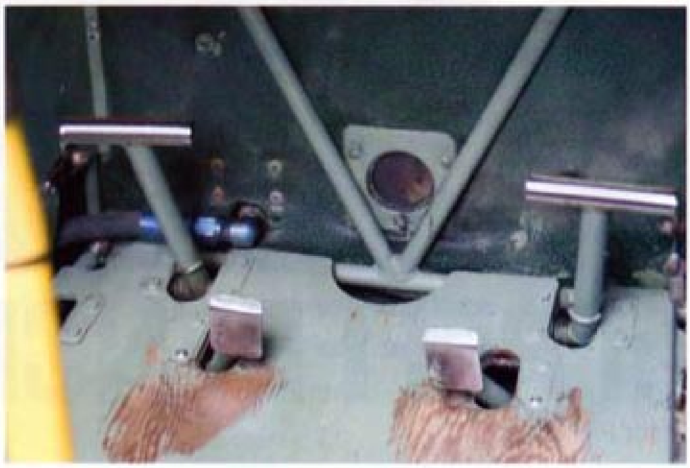
A nice view into the back of the mainwheel hub

The outer face of the mainwheel

The upper canopy glazing with interior framework framework

This is the port sidewall of the rear of the cockpit area

The instrument panel



The rudder pedals, brakes and pipeline to fuel tank visible in the left corner

The rear bulkhead with the header tank

The port wingtip light

Looking back into the open cockpit area

The port sidewall in the forward section of the cockpit

The access doors folded down

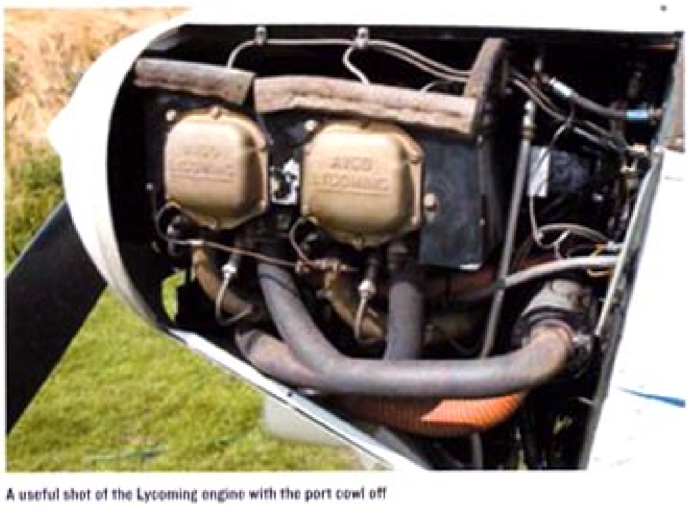
Detail of the disc brake on the mainwheel

The control cable roller behind the wing strut

This shot of this aircraft's instrument panel shows you another layout to this area

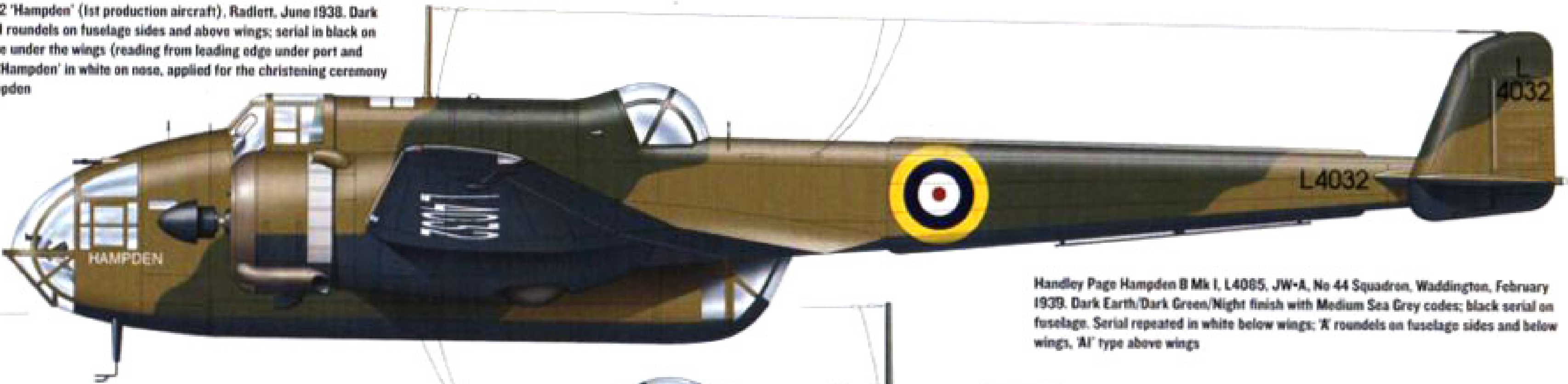
Details of the end of the wing inside the cockpit, this is the port wing...

...while this is the starboard

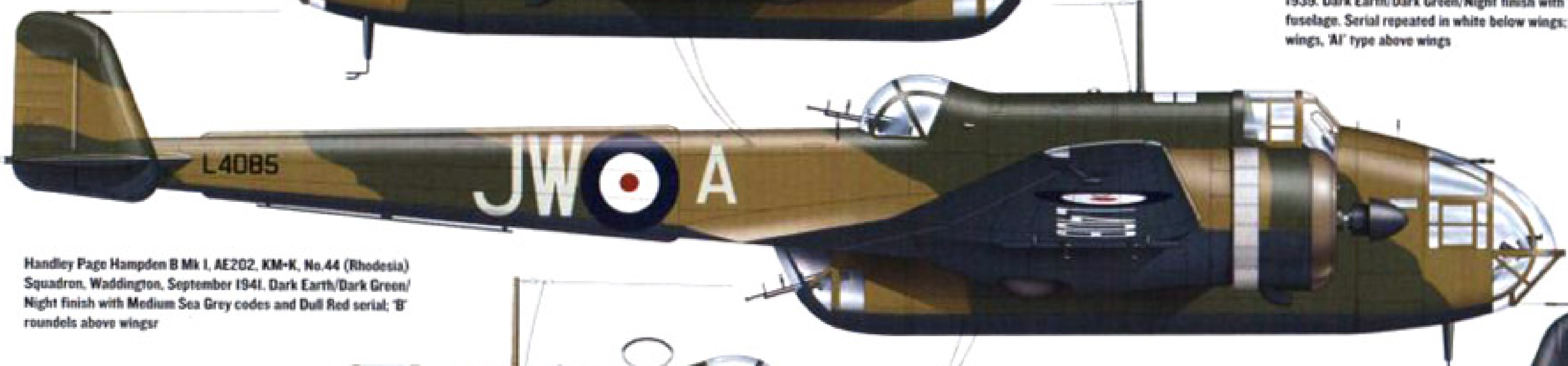


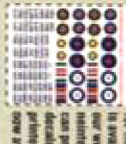
A useful shot of the Lycoming engine with the port cowl off

Handley Page Hampden B Mk I, L4032 'Hampden' (1st production aircraft), Radlett, June 1938. Dark Earth/Dark Green/Night finish with A1 roundels on fuselage sides and above wings; serial in black on fuselage and rudder, repeated in white under the wings (reading from leading edge under port and from trailing edge under starboard). 'Hampden' in white on nose, applied for the christening ceremony on 24 June 1938 by Viscountess Hampden



Handley Page Hampden B Mk I, L4085, JW•A, No 44 Squadron, Waddington, February 1939. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes; black serial on fuselage. Serial repeated in white below wings; 'A' roundels on fuselage sides and below wings, 'A1' type above wings





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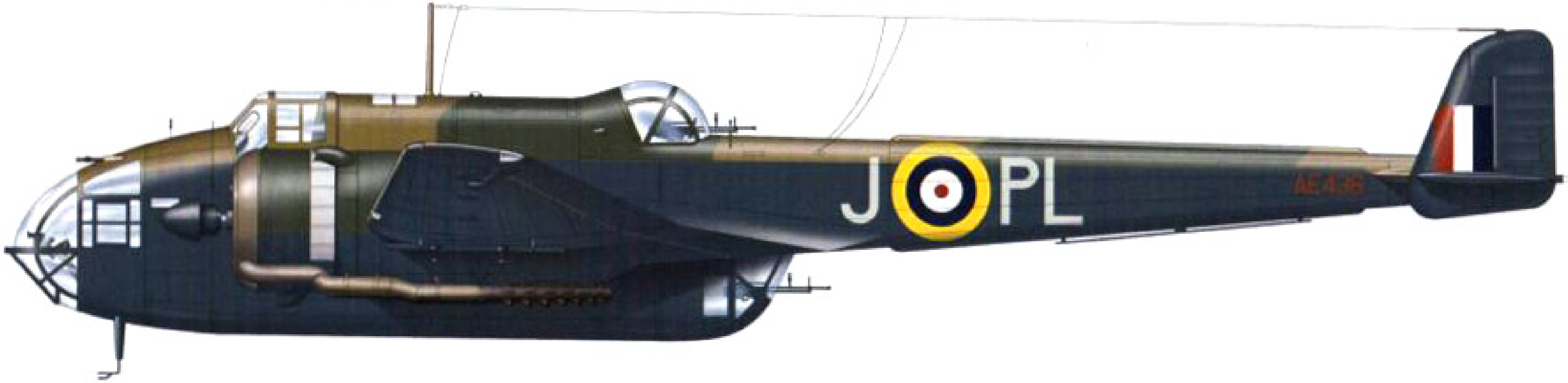
Handley Page Hampden B Mk I, AE202, KM•K, No.44 (Rhodesia) Squadron, Waddington, September 1941. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and Dull Red serial; 'B' roundels above wingsr

Handley Page Hampden B Mk I, AE436, PL•J, No.144 Squadron, North Luffenham, early 1942. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and Dull Red serials; 'B' type roundels above wings



Profiles 1:72 Scale

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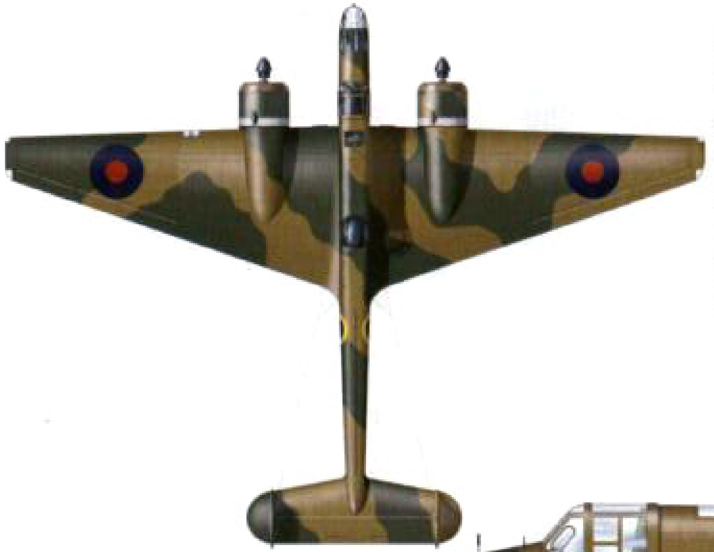


Plan views showing 'A' pattern used on Hampdens with even-ending serials (left) and 'B' pattern for odd-ending serials (right); wing markings consist of 'B' type (left) and 'AI' type (right)

All the unique marking artwork for the profiles on this page is available to download from our website (www.modelairplaneinternational.com) so that you can produce these options as decals using the numerous ink jet printer compatible decal papers now available

Below: Handley Page Hampden B Mk I, P1333, EA•F, No.49 Squadron, Scampton, June 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes; black serial. 'B' roundels above wings, 'A' type below wings

Further Down: Handley Page Hampden B Mk I, P1258, ZN-W, No.106 Squadron, Finningley, 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes; black serial. 'B' type roundels above wings

Model Airplane International
Original Artwork by Richard J. Caruana © MAI 2009

Handley Page Hampden TB Mk I, AN127, XA•Y, No.489 Squadron RNZAF, 1944. Medium Sea Grey uppersurfaces with Sky undersides; white codes, Night serial. 'B' type roundels above wings. Note deepened bomb bay

Profiles 1:72 Scale

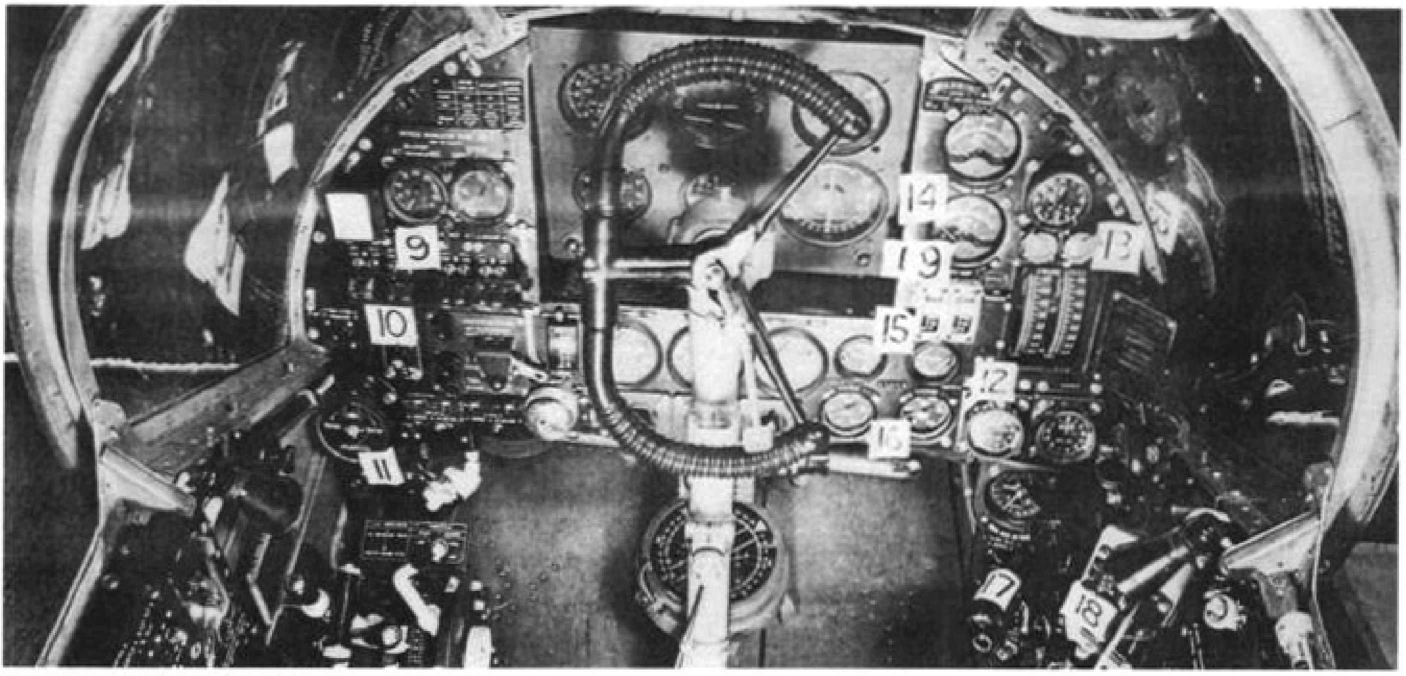
0 METRES 1 2

0 FEET 3 6

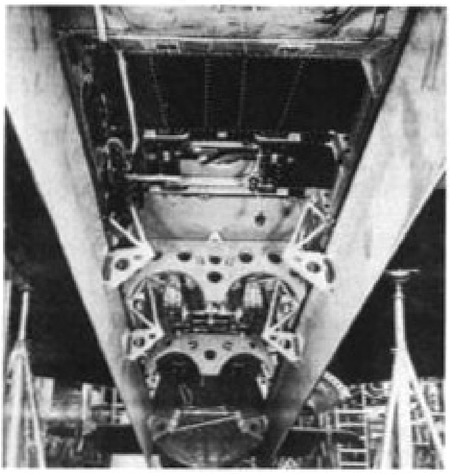
1:1 REFERENCE

Detail images of the B Mk I Hampden are rare, most of those we have seen are of the TB Mk I, so what follows is a selection of illustrations from the Air Publication as well as some images from the manufacturer dating back to the late 1930s. These latter items are not of the best quality but are offered here simply because of the information they offer the modeller of both the Valom 1:72 and the Fonderie Miniatures 1:48 kits

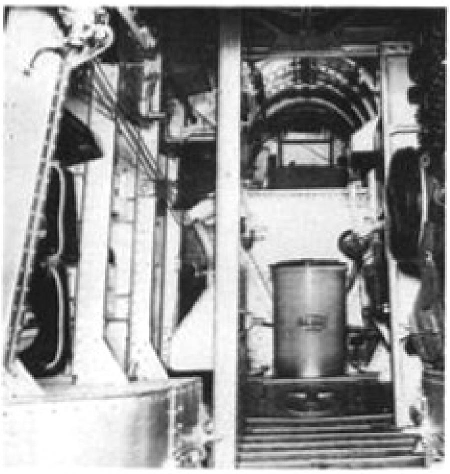
Note: If anyone out there has more reference on the interior of the Hampden, please get in contact with the Editor (editorial@modelairplaneinternational.com), who as a life-long fan of the type is always on the lookout for technical stuff!

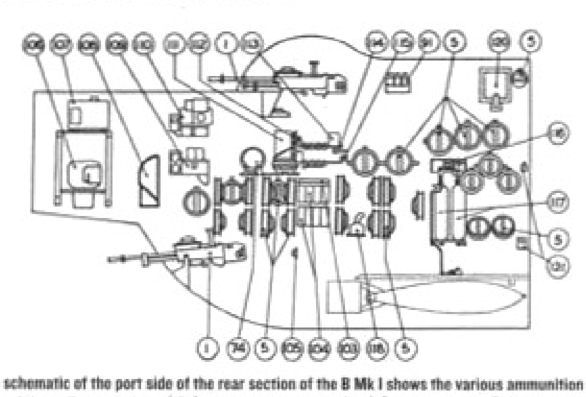


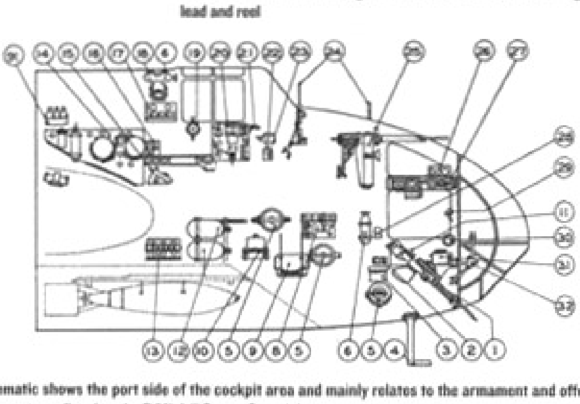
This period image is of the instrument panel etc. in the cockpit


Here we have a shot up into the bomb bay looking aft. The twin curved formers in the centre of the image confirm the bomber configuration, as the torpedo-bomber carried its load partially outside the bomb bay with the bomb doors slightly open

A useful shot of the undercarriage with all the nacelle removed so you can see the rear sections of the undercarriage legs as well as the route of the pipework etc down the oleo leg


This period shot is taken from the ventral gunner's position looking forward. You can see the door between the front and rear sections as well as the Elsan toilet in front of the spar bulkhead. The upper gunner's seat is stowed to the right and in front of that is the trailing aerial lead and reel


This schematic of the port side of the rear section of the B Mk I shows the various ammunition stowage (5) and the radio transmitter (107) plus vertical camera (106) [probably an F.24]. Sadly we don't have the key to this image so we can't identify everything by its official terminology ©Crown Copyright


This schematic shows the port side of the cockpit area and mainly relates to the armament and offensive ordnance systems fitted to the B Mk I ©Crown Copyright

AF829/69, one of the Northrop-built Vengeance Mk IIs repossessed by the USAAC and operated as a gunnery trainer. These aircraft retained the original RAF-style camouflage as specified by the British Purchasing Commission

DIVING WITH A VENGEANCE

Along with the Brewster Bermuda, the Vengeance was purchased to give British forces their own 'Stuka'

With the Luftwaffe's 'Stuka' clearing the way for the German army at an unprecedented pace, both Britain and the United States (US) began to seriously consider adding their own version of a Junkers Ju 87 to their inventory. While the US could adapt naval types, such as the SBD Dauntless, for its own need, Britain was forced to concentrate all its production efforts on fighter aircraft as the threat to the homeland increased daily.

Acquisitions by the British Purchasing Commission from the US can only be judged with hindsight as lacking focus, mainly due to the considerable proportion of those aircraft never making it to the United Kingdom. Two of these types, ordered as dive-bombers, consisted of the Brewster Model 340 (Bermuda) and the Vultee Model V-72 (Vengeance). The latter had failed to obtain US Army Air Corps (USAAC) or USN backing, but development continued as the French Armée de l'Air showed considerable interest in the type way back in 1938. Vultee had received an order for 300 V-72s with start of deliveries scheduled for October 1940; however, by that time France had already been overrun.

A British contract for 200 examples was placed on 3 July 1940 and to speed up the design and development, together with the rate of production and delivery, a further 200 examples were ordered through Northrop, to be built at their Hawthorne plant in California. By 30 September, the total on order had risên to 600 examples and although the first aircraft was, according to the contract, to be delivered within six months, it was only on 30 March 1941 that the first prototype took to the air.

By the time of its appearance, the V-72 had been named 'Vengeance'. It was a low-wing monoplane with an enclosed cockpit to house a crew of two. It was powered by the air-cooled Wright Cyclone GR-2600-A5B-5 twin-row, 14-cylinder engine rated at 1,600hp and was armed with a pair of .30in (7.6mm) Browning machine guns in each wing plus a similar or .303in (7.7m) gun (twin guns on later versions) on a flexible mount in the rear cockpit. It could also carry two 500lb (230kg) bombs in an internal bomb bay and later versions had provision for an additional 250lb (110kg) bomb to be carried under each wing.

A trio of Vengeances from No. 12 Squadron flying in formation near Merauke in December 1943: A27-216/NH•Q, A27-209/NH•L and A27-261 (uncoded). Note the various degrees of weathering on the camouflage finish (RAAF, via J. Kightly)

Designed to dive vertically, rather than at an angle, the Vengeance wings were set at 0° angle of incidence, resulting in an aircraft that cruised at a nose-up attitude, providing the pilot with very poor forward vision. The unusual 'W' wing planform was the result of an error in calculating the aircraft's centre of gravity; it was found to be much easier to slide the outer sections of the wings rather than redesigning the whole wing root.

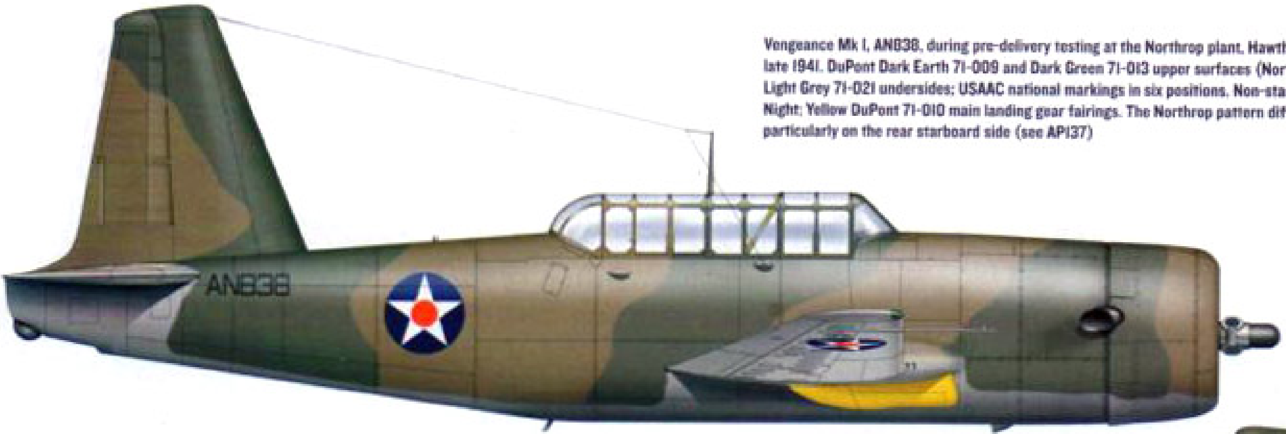
PRODUCTION AND VERSIONS

By June 1941, Britain had ordered more V-72s under the Lend-Lease scheme, whereby the Vengeance was given the USAAC designation of A-31. The first Vengeance (AN838) for the Royal Air Force (RAF) flew on 30 November 1941 at Northrop's Hawthorne airfield, were the first batch of 200 Mk Is (AN838-AP137) were built under licence. These were followed by the second batch of 200, designated Mk Ia (EZ800-EZ999), and built by Northrop as the A-31A-NO. The main difference was in that these were powered by the R-2600-19 Wright Cyclone which, however, provided exactly the same power as the -A5B.

By December 1941 the Mk II appeared. Built to a total of 1,501 examples (of which AF745-944, AN538-837 were for the RAF), it represented the major production version; AN679 of the second batch crashed before delivery and was replaced by FP686. With the Japanese attack on Pearl Harbor, however, the US repossessed a number of A-31s for use by the USAAC. This led to an interest by the Air Corps in dive-bombers and it requested the production of a version to its own designation by Vultee. This became the A-35 and was built in two distinct versions: the A-35A with a 4° wing incidence, powered by the 1,700hp R-2600-8 or -13 and four wing .50in (12.7mm) M2 Browning machine guns (99 examples built), and the A-35B where the wing guns were increased to six (831 examples built). The two versions also differed in the span of their inboard wing sections, the former being 6' 8" (203cm) while the latter's was 5' 9.5" (176.5cm); overall span remained 48' (14.63m).

While the Vengeance managed to make good some of the losses suffered in Hawaii and the Philippines early in the war, the USAAC seemed to have been at a loss as to how best to use the Vengeance and it was only May 1942 that the type began to enter operational service. Even then, these were relegated to training and target towing duties. On the other hand, very few Vengeances Mk I and Mk II reached the UK, 137 examples being immediately diverted to the Royal Australian Air Force (RAAF) while others were shipped to equip RAF squadrons in India.

200 Mk IIIs were built (FB918-FD117, US designation A-31A-VN) under Lend-Lease, these being similar to the Mk Ia. Finally, the Mk IV appeared, similar to the USAAC A-35B built under Lend-Lease for the RAF and RAAF, the former receiving 458 examples, the latter 121. RAF serials for these were as follows: FD118-FD417; HB300-HB550; KG810-KG820.



Vengeance Mk I, AN838, during pre-delivery testing at the Northrop plant, Hawthorn, California, late 1941. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces (Northrop pattern) with Light Grey 71-021 undersides; USAAC national markings in six positions. Non-standard style serial in Night; Yellow DuPont 71-010 main landing gear fairings. The Northrop pattern differed very slightly, particularly on the rear starboard side (see AP137)

Vengeance Mk IA, EZ856, during flight testing at Northrop plant, Hawthorn, early 1942. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces (Northrop pattern) with Light Grey 71-021 undersides; US star markings in six positions modified without the red centre. Serial in Night

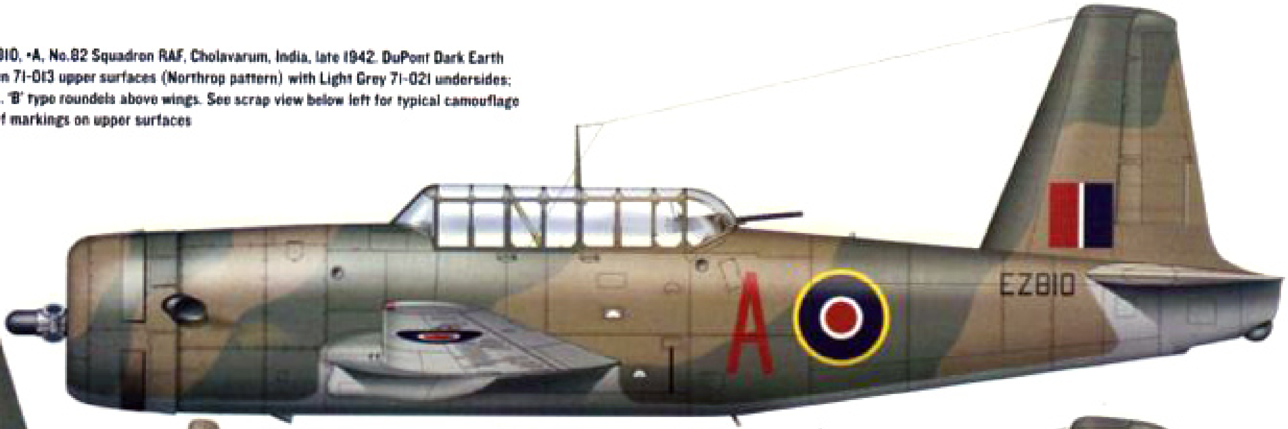
Vultee V-72 (Vengeance Mk II), AF829, repossessed by the USAAF for use as air gunnery trainer, 1942. DuPont Dark Earth 71-065 and Dark Green 71-013 upper surfaces with Light Grey 71-021 undersides; star markings on fuselage sides, above port and below starboar wings. Night serial, white code 'C'; white decoration around front of engine cowling

Vengeance Mk I, AP137, No.84 Squadron RAF, Ceylon, spring 1942. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces (Northrop pattern) with Light Grey 71-021 undersides; Night serial. 'B' type roundels above wings

Vengeance Mk IA, AN957, •Y, No.82 Squadron RAF, Cholavarum, India, late 1942. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces with Light Grey 71-021 undersides; Red code, Night serial. 'AI' roundels on fuselage sides, 'A' type below wings, 'B' type above wings

Profiles 1:72 Scale

Vengeance Mk IA, EZ810, •A, No.82 Squadron RAF, Cholavarum, India, late 1942. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces (Northrop pattern) with Light Grey 71-021 undersides; Red code. Night serial. 'B' type roundels above wings. See scrap view below left for typical camouflage pattern and position of markings on upper surfaces



Vengeance Mk II, AN709, OB•V, No.45 Squadron RAF, Khumbirgram, India, late 1942. DuPont Dark Earth 71-065 and Dark Green 71-013 upper surfaces with Light Grey 71-021 undersides; SEAC blue/white roundels in six positions (note unequal white/blue fin sections). Codes and 'Saint' marking on forward fuselage in Medium Sea Grey; Night serial

Vengeance Mk IIa, AF819, trials aircraft in USAAF markings, summer 1943. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces with Light Grey 71-021 undersides; star markings with white side bars and red outline on fuselage sides, above port and below starboard wings. Serial in Night

Profiles 1:72 Scale

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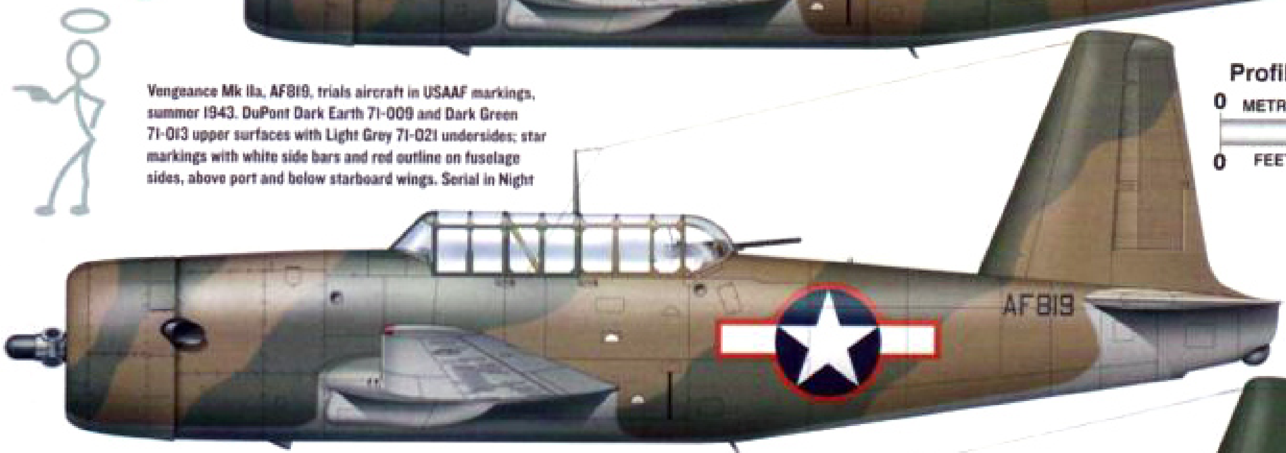
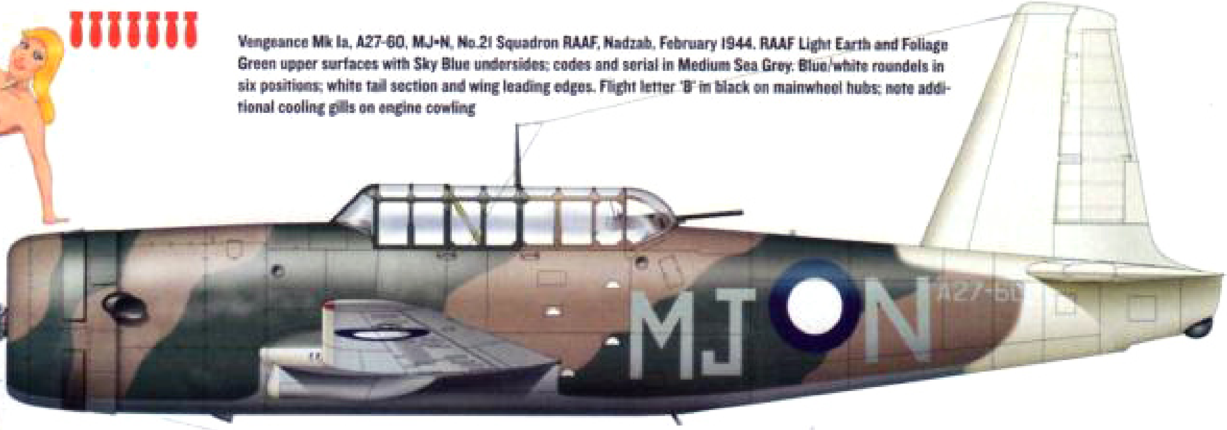


Vengeance Mk IIa, A27-209, NH•L, No.12 Squadron RAAF, Cooktown (North Queensland), early 1944. RAAF Light Earth/Foliage Green upper surfaces, with Sky Blue undersides; Medium Sea Grey codes and serials. Blue/white roundels in six positions; note red section of earlier fin flash patched up with, possibly, Earth Brown. Name 'Dianne' in white on cowling, port side only

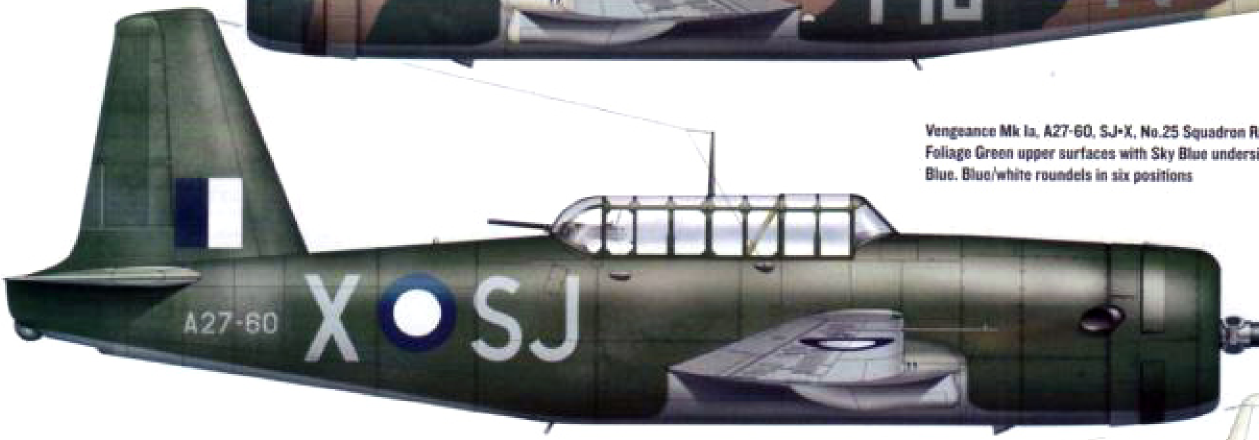
Vengeance Mk IIa, A27-228, SJ•A, No.25 Squadron RAAF, Guildford (Western Australia), early 1944. RAAF Earth Brown/Foliage Green upper surfaces (with brown areas overpainted in part probably in Light Earth) and Sky Blue undersides; white codes, Medium Sea Grey serial. Blue/white roundels in six positions

Vengeance Mk Ia, A27-48, NV•S , No.23 Squadron RAAF, Nadzab, early 1944. RAAF Light Earth/Foliage Green upper surfaces with Sky Blue undersides; codes and serial in Medium Sea Grey. White tail section; blue/white roundels in six positions. Nose art 'Lest We Forget' on port side only

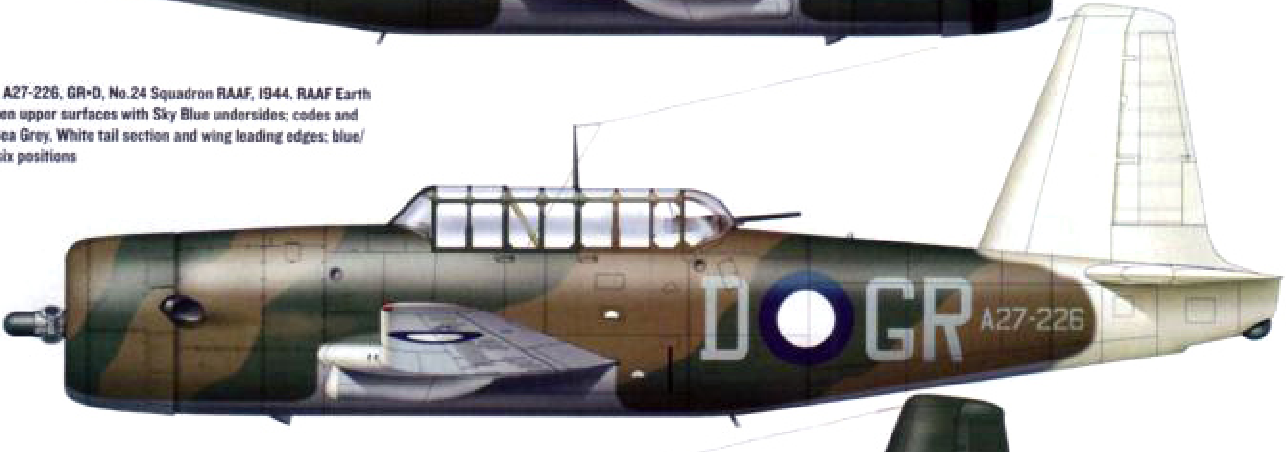
Vengeance Mk Ia, A27-60, MJ•N, No.21 Squadron RAAF, Nadzab, February 1944. RAAF Light Earth and Foliage Green upper surfaces with Sky Blue undersides; codes and serial in Medium Sea Grey. Blue/white roundels in six positions; white tail section and wing leading edges. Flight letter 'B' in black on mainwheel hubs; note additional cooling gills on engine cowling



Vengeance Mk Ia, A27-60, SJ•X, No.25 Squadron RAAF, November 1944. RAAF Foliage Green upper surfaces with Sky Blue undersides; codes and serial in Sky Blue. Blue/white roundels in six positions



Vengeance Mk IIa, A27-226, GR•D, No.24 Squadron RAAF, 1944. RAAF Earth Brown/Foliage Green upper surfaces with Sky Blue undersides; codes and serial in Medium Sea Grey. White tail section and wing leading edges; blue/white roundels in six positions



Vengeance Mk IVa, A27-412, AF•V, No.5 Communications Flight RAAF, 1944. Foliage Green upper surfaces with Sky Blue undersides; codes and serial in Sky Blue. Blue/white roundels in six positions; note additional cooling gills on cowling

Profiles 1:72 Scale

0 METRES 1 2

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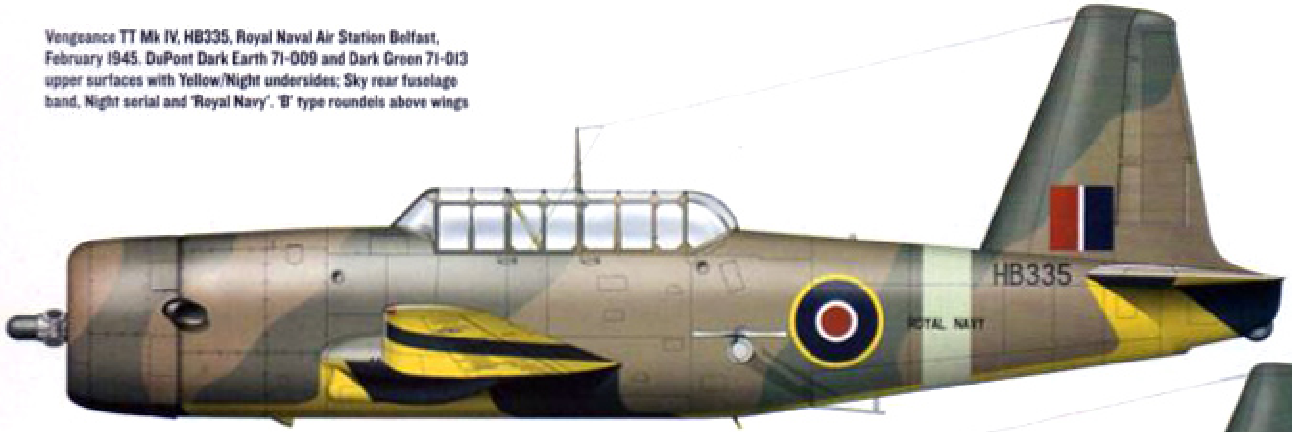
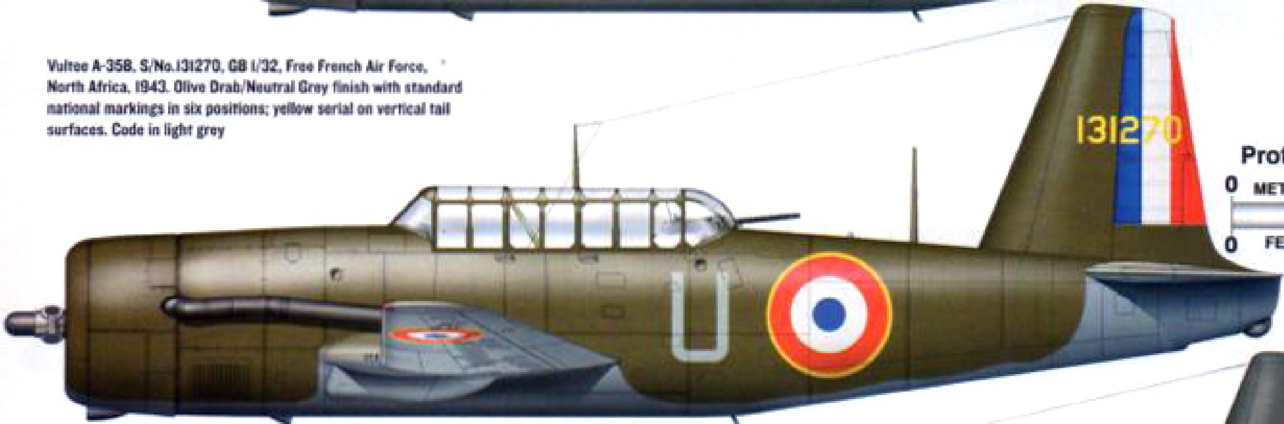
Vengeance TT Mk IV, HB335, Royal Naval Air Station Belfast, February 1945. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces with Yellow/Night undersides; Sky rear fuselage band, Night serial and 'Royal Navy'. 'B' type roundels above wings



Vengeance Mk II, AN581, Grupo de Bombardeiro Picado, Brazilian Air Force, Santa Cruz Air Base, 1943. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces (Northrop pattern) with Light Grey 71-021 undersides; white serial, national markings on fuselage sides and above wings

Vultee A-35B, S/No.131270, GB I/32, Free French Air Force, North Africa, 1943. Olive Drab/Neutral Grey finish with standard national markings in six positions; yellow serial on vertical tail surfaces. Code in light grey



Profiles 1:72 Scale
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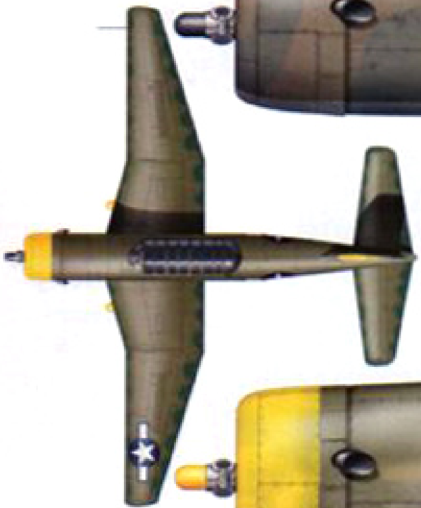
Vengeance Mk IV, 'P' (serial unknown), No.8 Squadron Indian Air Force, spring 1944. DuPont Dark Earth 71-065 and Dark Green 71-013 upper surfaces with Light Grey 71-021 undersides; 'CI' roundels on fuselage sides, 'B' type above wings. White code



Vultee A-35B, S/No.131589, 'G', hack aircraft with No.446 Heavy Bomb Group, AAF Station 125 Flixton, Bungay, Suffolk, spring 1945. Olive Drab upper surfaces with Medium Green dabbling to leading edges of all flying surfaces; Neutral Grey undersides. US star national markings on fuselage sides, above port and below starboard wings; black serial and 'WW' on fin, light grey code 'G'. Yellow propeller hub, front of cowling, main landing gear fairings and wheel hubs, and top of fin/rudder. An ex-target tug, with towing winch removed

An RAAF Vengeance target-tug (A27-14) displays its underside black and yellow stripes, typical for this role. Note that the air-driven winch was fitted to the starboard side, whereas Vengeance target-tugs for the RAF and FAA had the winch on the port side (RAAF, via J. Kightly)

INTO SERVICE

Enthusiasm for use of the Vengeance by the RAF waned considerably following the miserable success scored by enemy dive-bombers during the Battle of Britain, where the Ju 87's weaknesses all came to the fore. It was, therefore, decided to use the Vengeance in the jungles of Burma where dive-bombing tactics could still be considered acceptable during close-support operations with British and Indian troops. No. 80 Squadron (RAF) began converting onto the new type at Cholavaram in October 1942 from the Blenheim Mk IVs then in use; No. 110 Squadron soon followed, receiving its Vengeances at Ondal. During December two other RAF units re-equipped with the type – No. 45 Squadron at Cholavaram and No. 84 Squadron at Vizagapatam. In addition, No. 7 Squadron of the Indian Air Force (IAF) was formed at Peshawar on the Vengeance with personnel from Nos. 3 and 6 Squadrons. Finally another IAF squadron was formed – No. 8 – receiving its aircraft in April 1943, being declared operational the following June.

These units became extremely active during the second Arakan campaign, being heavily engaged in defending Imphal and Kohima from Japanese attacks well up to July 1944. By that time, the Vengeance had become more than obsolete in the role for which it was designed and all these squadrons had retired the type from front-line service by the end of July. Vengeance deliveries, however, continued to pour into Britain from the massive orders that had been placed under Lend-Lease and more than 100 Mk IVs were converted to target tugs (redesignated TT Mk IV) by Cunliffe Owen. These modifications included the installation of a drogue stowage box below the bomb bay, a wind-driven winch on the port side of the rear fuselage and protective cables around the tail unit. All armament was removed and both the RAF and Fleet Air Arm (FAA) operated this version.

WITH THE RAAF

Meanwhile deliveries of the Vengeance to the RAAF had begun in July 1942, only to come to an abrupt halt after the first 15 examples had arrived. It is possible that small numbers continued to trickle in, since by December No. 12 Squadron (RAAF) is on record as having 18 Vengeances, together with six Wirraways, on strength. Deliveries in substantial numbers did not begin until April 1943.

At first No. 12 Squadron flying from Batchelor was restricted to flying patrols in the vicinity of Darwin. The first chance to take the new aircraft into action came on 13 June 1943 when 12 Vengeances were escorted by six Beaufighters of No. 31 Squadron in an attack against the construction of a Japanese airstrip at Selaru Island (Tanimbar Islands, east of Timor). All the dive-bombers (with the exception of one that went unserviceable during the refuelling stop at Bathurst) hit their targets and returned safely to base.

Australia had ordered considerable numbers of Vengeances. Those bearing serials between the A27-1 to A27-99 A27-200 to A27-321 range came from RAF Vengeance Mk I and Mk II orders that were diverted to the RAAF, while those from A27-400 onwards were built to RAAF orders to Mk IV and Mk IVa standard. As delivery of these aircraft flowed into Australia during 1943 other RAAF units began to convert to the type, including Nos. 21 and 23 Squadrons at Lowood (Queensland), No. 24 at Menangle (NSW) and No. 25 at Pearce (WA).

No. 24 Squadron went to Kiriwina in November 1943 and later joined Nos. 21 and 23 Squadrons at Nadzab (New Guinea) in January of the following year. During the six-weeks of operations, RAAF Vengeances in this theatre of operations continually hit enemy airfields, barges and infantry positions with great accuracy. In February 1944, No. 23 Squadron was involved in striking targets in support of American ground forces around Saidor, while No. 24 Squadron performed a number of very accurate attacks against enemy-occupied towns and the Japanese positions at Shaggy Ridge. Their Vengeances also provided air support during the Cape Gloucester landings. Operations in New Guinea came to an end on 8 March 1945 when 36 aircraft attacked Rempi. No. 25 Squadron remained at Cunderdin (WA) where it provided air support exercises to Army units.

By the beginning of 1945, all these RAAF squadrons had been re-equipped with the Consolidated B-24 Liberator, their Vengeances having been transferred to second-line units. These included Nos. 1, 2, 4, and 7 Operational Training Units (OTUs), the Central Flying School at Parkes (NSW) and Nos. 1, 3, 4, 5, 6, 7 and 8 Communications Units (CUs). Lend-Lease terms of reference provided for the return of such aircraft to the US after the war. Seeing that there was no use for the Vengeance there, those still on RAAF inventory were scrapped, with the exception of A27-99 (ex-EZ999), now restored and displayed at the Camden Aviation Museum of Aviation at Narellan (NSW), and A27-247 (ex-AF929) awaiting restoration at Precision Aerospace, Wangaratta (Victoria).

ACKNOWLEDGEMENTS:

My sincere thanks to John Smith (UK) and James Kightly (Australia) for their assistance in the preparation of this feature. ■

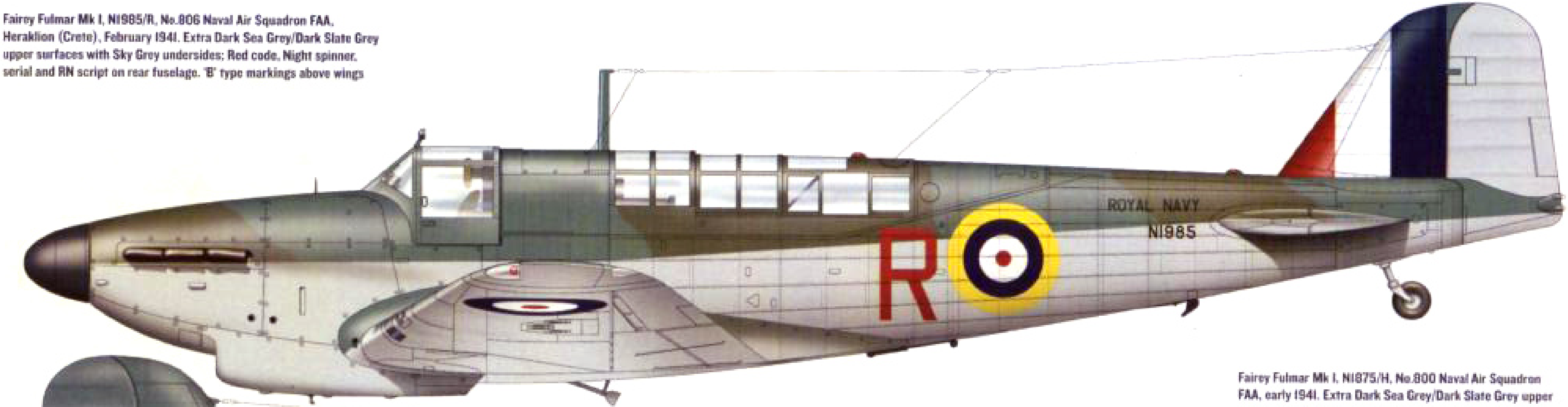
CAMOUFLAGE MASKS

One of the best ways to paint camouflage patterns on a model is to use paper masks, so with this in mind this month sees the launch of downloadable camouflage patterns from our website.

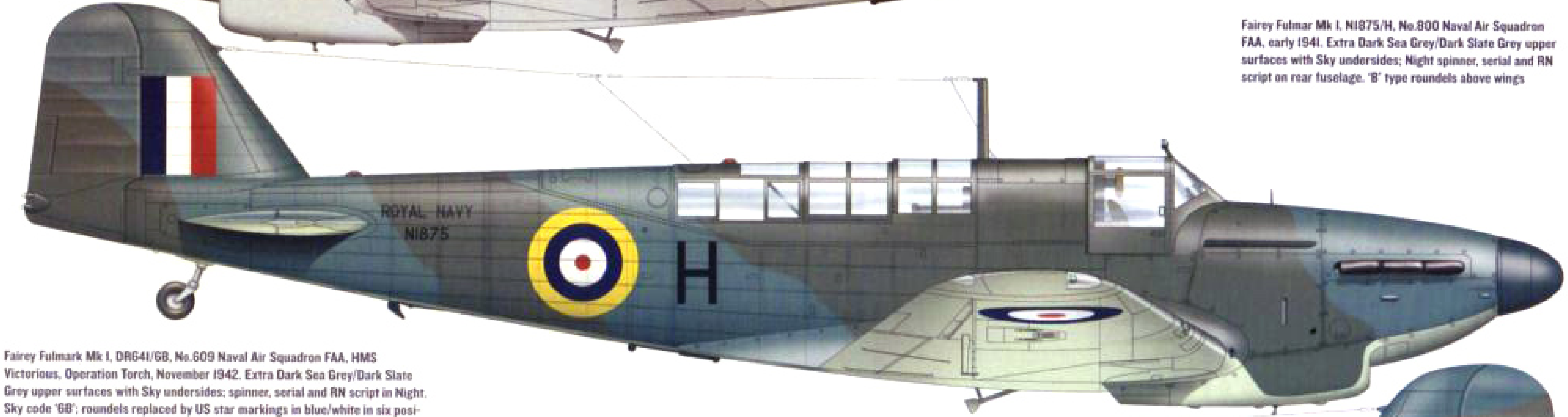
We start with the Vengeance to tie in with this article, and will add new subjects on an occasional basis.

Visit www.modelairplaneinternational.com on a regular basis to keep up to date with this new facility.

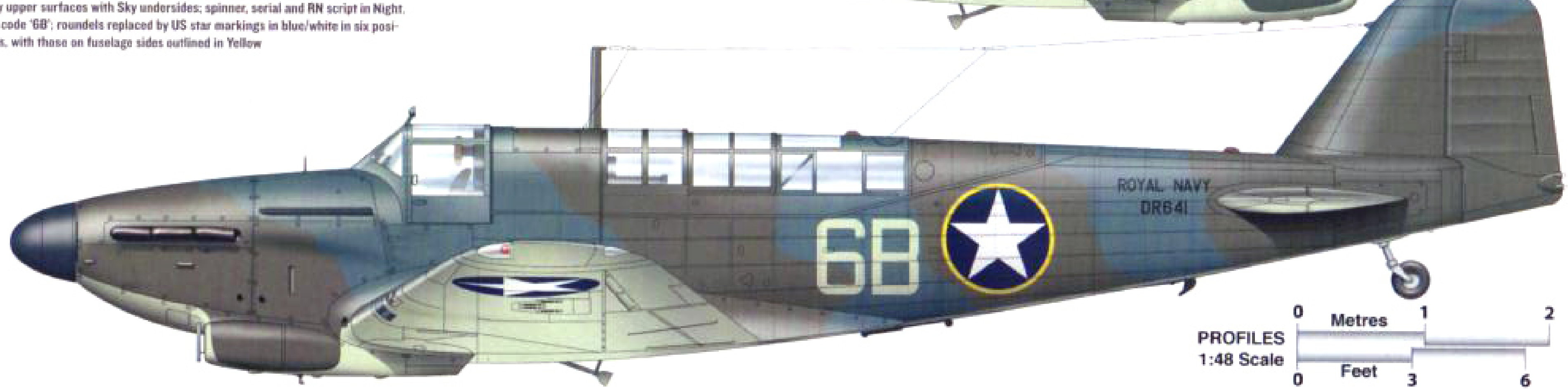
Fairey Fulmar Mk I, N1985/R, No.806 Naval Air Squadron FAA, Heraklion (Crete), February 1941. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky Grey undersides; Red code, Night spinner, serial and RN script on rear fuselage. 'B' type markings above wings



Fairey Fulmar Mk I, N1875/H, No.800 Naval Air Squadron FAA, early 1941. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; Night spinner, serial and RN script on rear fuselage. 'B' type roundels above wings



Fairey Fulmark Mk I, DR641/6B, No.609 Naval Air Squadron FAA, HMS Victorious, Operation Torch, November 1942. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; spinner, serial and RN script in Night. Sky code '6B'; roundels replaced by US star markings in blue/white in six positions, with those on fuselage sides outlined in Yellow



PROFILES
1:48 Scale

Metres 0 1 2
Feet 0 3 6

Fairey Fulmar Mk II, X8812, •6F, No.809 Naval Air Squadron FAA, Operation Pedestal, August 1942. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; code and spinner Sky. Night serial and RN script on fuselage; Yellow fin. 'B' type roundels above wings. On 11/12 August 1942 it was credited with damaging a Ju 88 and probably shooting down another

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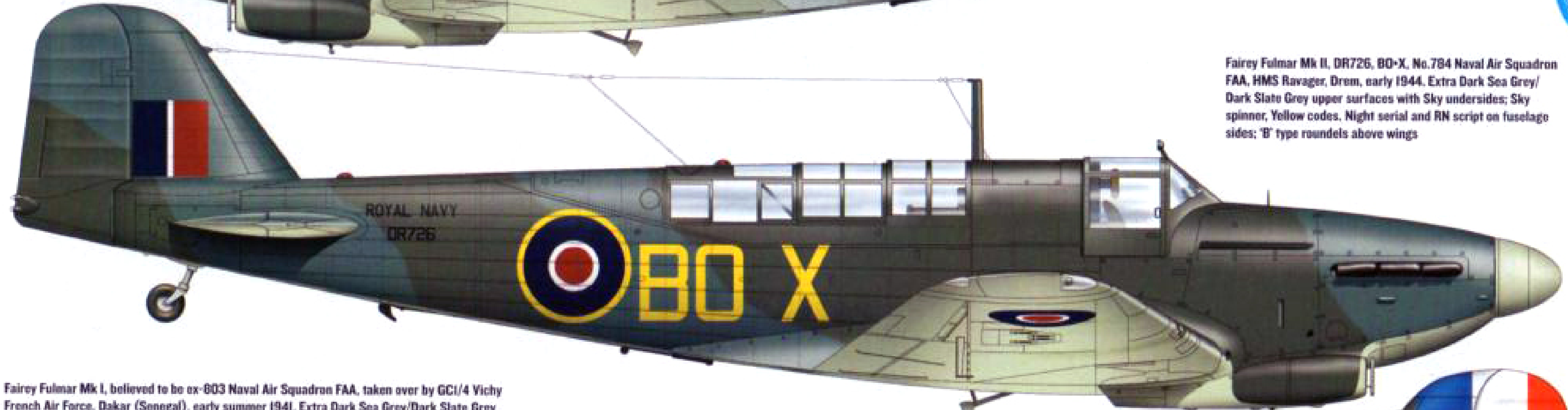
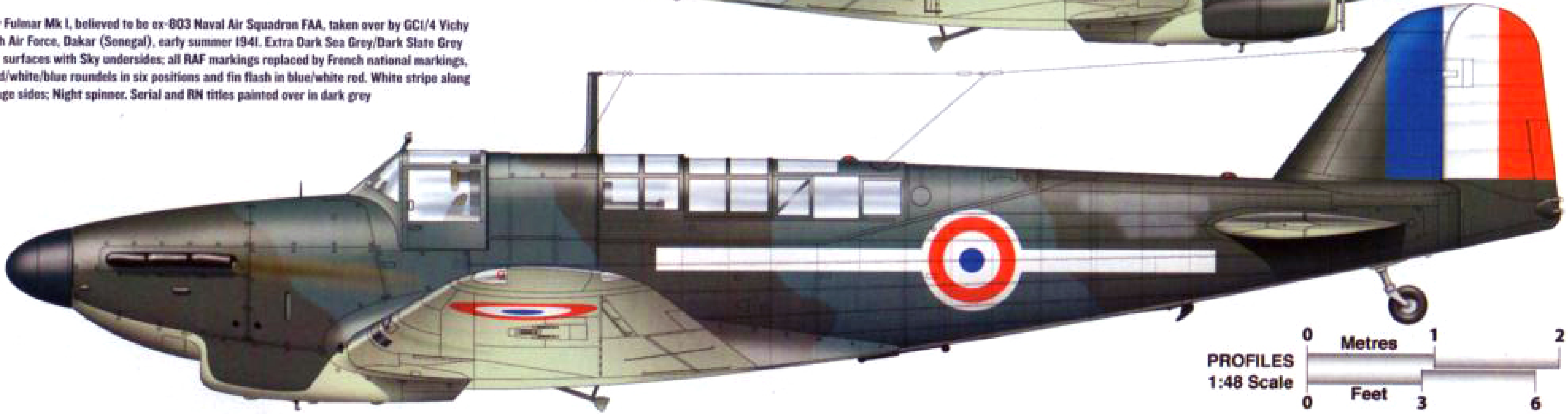
Fairey Fulmar Mk II, DR726, BO•X, No.784 Naval Air Squadron FAA, HMS Ravager, Drem, early 1944. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; Sky spinner, Yellow codes. Night serial and RN script on fuselage sides; 'B' type roundels above wings



Fairey Fulmar Mk I, believed to be ex-803 Naval Air Squadron FAA, taken over by GC1/4 Vichy French Air Force, Dakar (Senegal), early summer 1941. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; all RAF markings replaced by French national markings, i.e. red/white/blue roundels in six positions and fin flash in blue/white red. White stripe along fuselage sides; Night spinner. Serial and RN titles painted over in dark grey



PROFILES
1:48 Scale

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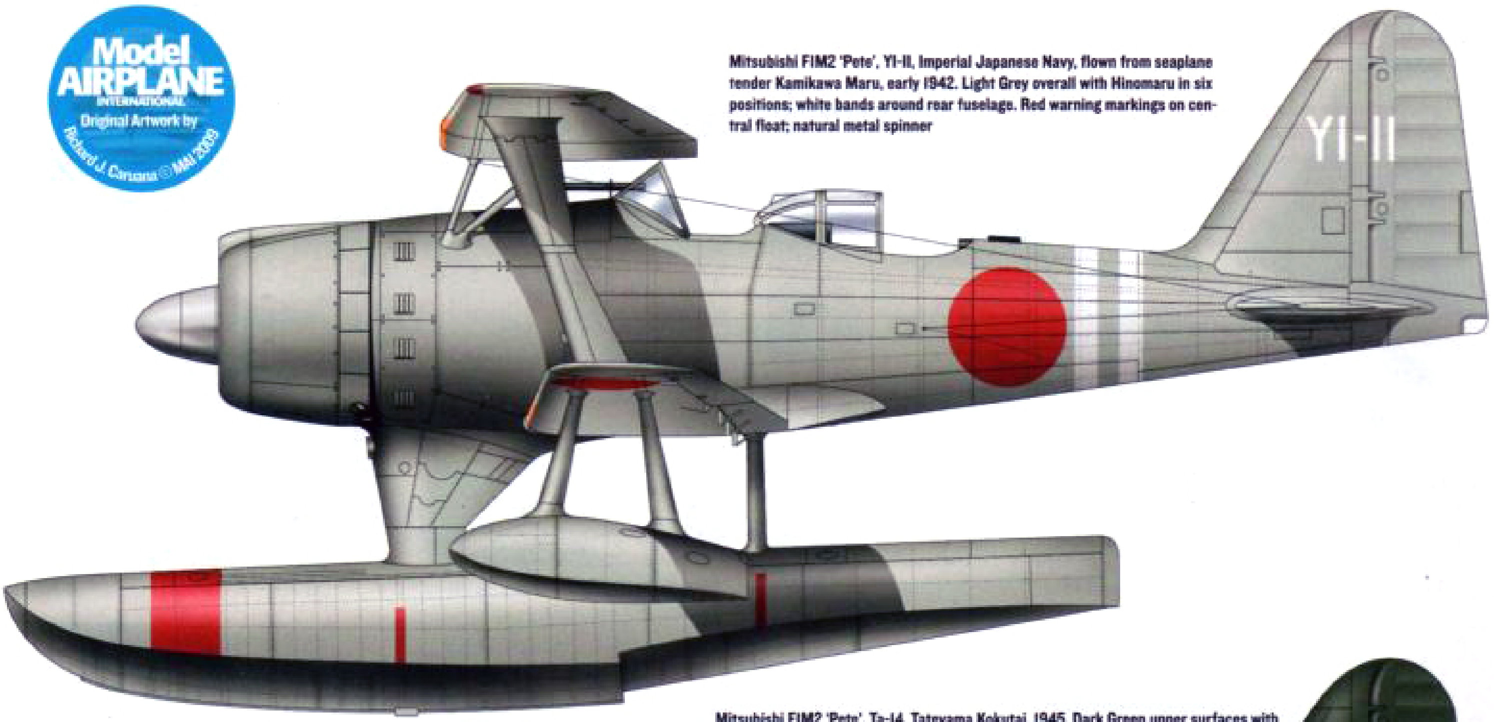
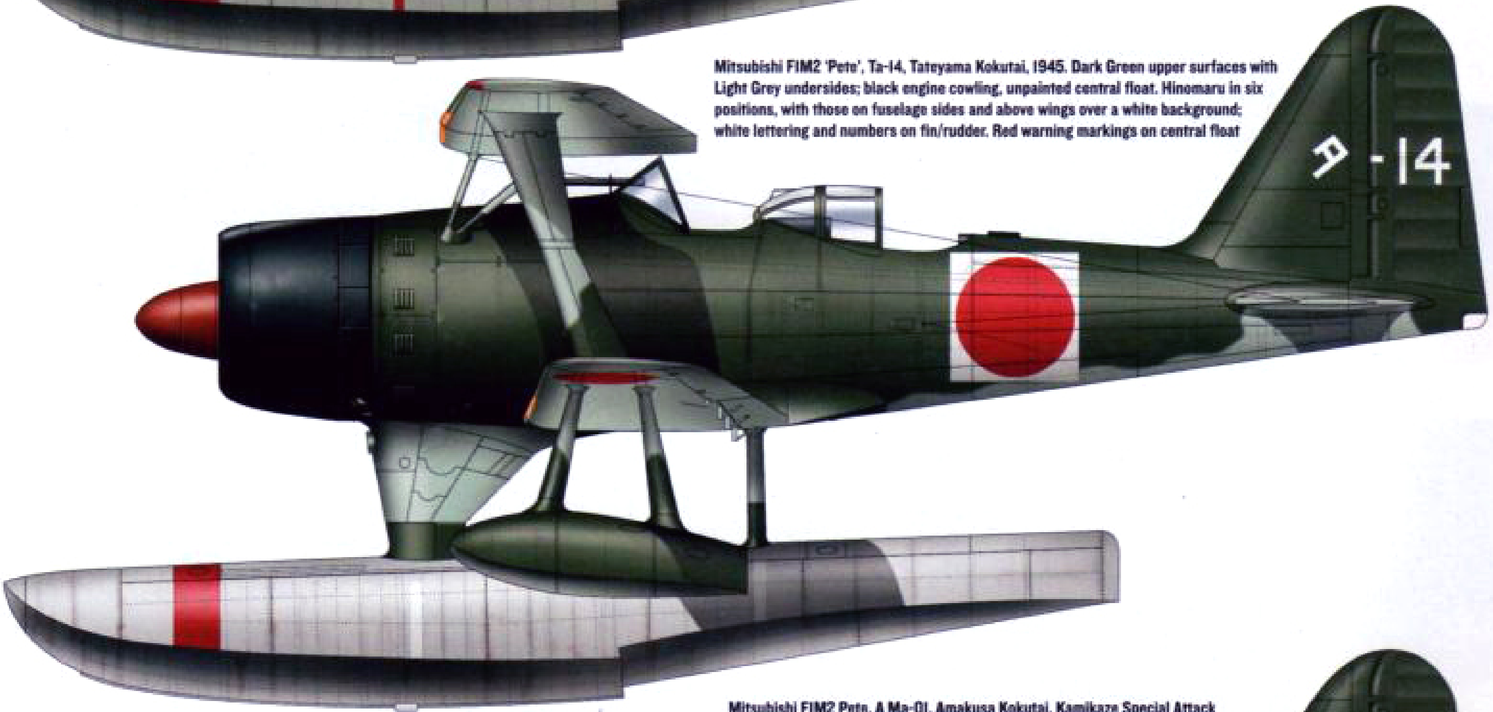
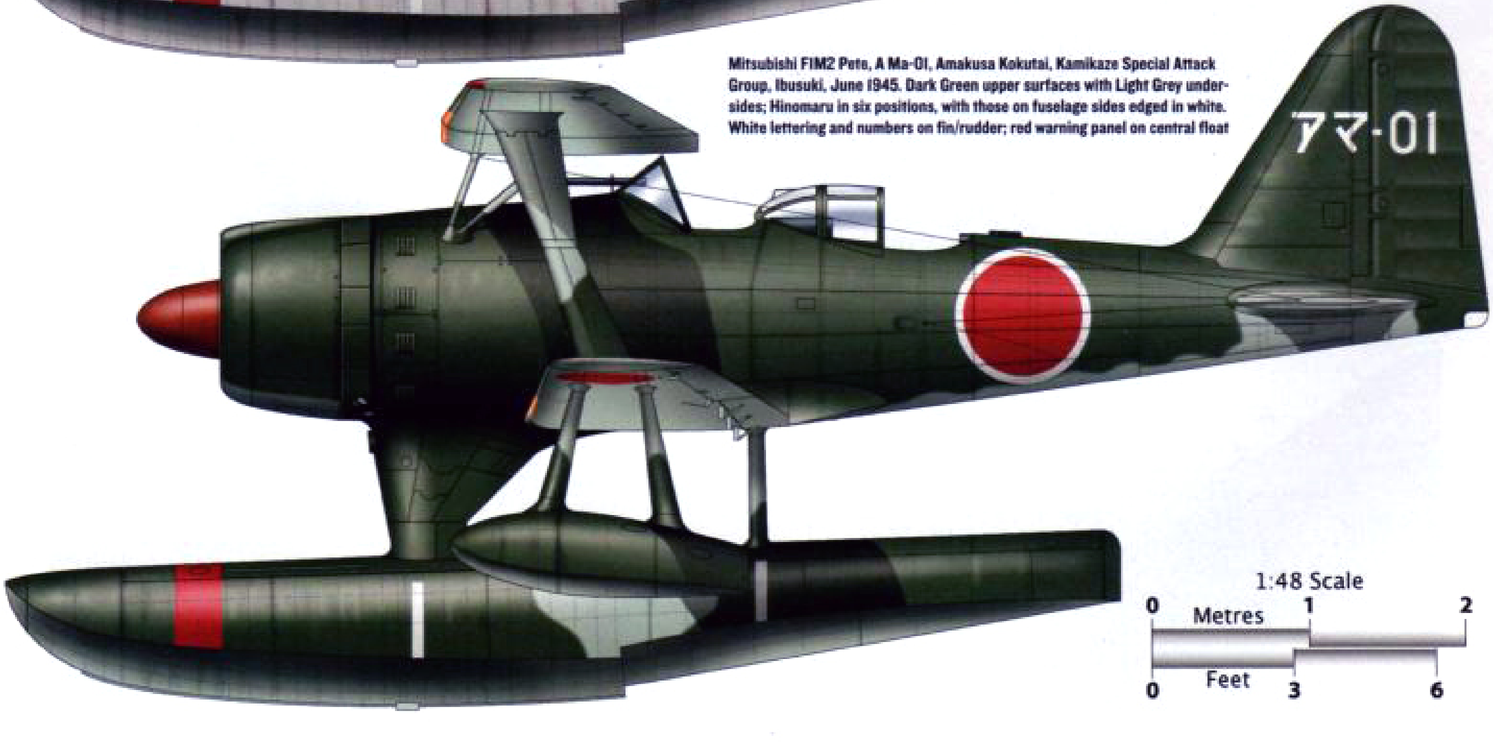
Mitsubishi F1M2 'Pete', Y1-11, Imperial Japanese Navy, flown from seaplane tender Kamikawa Maru, early 1942. Light Grey overall with Hinomaru in six positions; white bands around rear fuselage. Red warning markings on central float; natural metal spinner



Mitsubishi F1M2 'Pete', Ta-14, Tateyama Kokutai, 1945. Dark Green upper surfaces with Light Grey undersides; black engine cowling, unpainted central float. Hinomaru in six positions, with those on fuselage sides and above wings over a white background; white lettering and numbers on fin/rudder. Red warning markings on central float



Mitsubishi F1M2 Pete, A Ma-01, Amakusa Kokutai, Kamikaze Special Attack Group, Ibusuki, June 1945. Dark Green upper surfaces with Light Grey undersides; Hinomaru in six positions, with those on fuselage sides edged in white. White lettering and numbers on fin/rudder; red warning panel on central float



GRUMMAN'S MINIATURE CAT

The news of Japan's surrender was announced just as USS Langley was sailing out with VF-19 on board for the first operational tour of the Grumman F8F. This superb fighter was, therefore, not to see action during World War II

However, the Bearcat was to show its worth in Indo-China where it was blooded some ten years after its birth. Fast, manoeuvrable and an excellent gun platform, it was described by one of Grumman's test pilots as 'the first real fighter' he had flown.

Back towards the middle of 1943 the F6F Hellcat was reaching the peak of production, and its service record clearly promised that it was going to be one of those aircraft that would leave a mark on aviation history. One of its drawbacks, however, was its sheer size, no doubt reflecting the task that Grumman had set itself in its design to gain as much performance as possible from a massive engine and provide it with tremendous firepower – Japan demonstrated that this was not really necessary.

Conscious of all this, Grumman's engineers set as their new goal the realisation of a fighter of the smallest possible dimensions all round, without compromising on performance or armament. There was also the challenge to attain a higher maximum speed than that of the F6F. Wherever possible the proven features of the Hellcat design were retained, curing those aspects that were considered deficient while improving also on the type of smooth flush-rivetted finish so as to squeeze out every drop of performance.

The small size of the new fighter, bearing Grumman's designation of G-58, meant easier storage on board USS carriers. A new feature, introduced during the design stage, was a 'weak point' in the outer wing's chord section that permitted the wingtips to break off if inadvertently overstressed, thus saving the airframe from disintegrating at some other, more critical, point. It had been estimated that with the remaining wing surfaces enough control would remain to enable a pilot to bring the aircraft safely home.

Aerodynamics clearly received close attention throughout the whole planning stage of the project. A neatly shaped bubble canopy was chosen to enclose the pilot's cockpit, radiators were built into the wing leading edges while the engine was neatly, but very closely, cowled.

"Yesterday and Tomorrow", says the caption on the back of the original photo taken on 9 August 1957. The Bearcat and Tigercat mark the end of piston engined aircraft and the introduction of the jet era for Grumman's series of 'Tiger' naval fighters (U.S. Navy)

DEVELOPMENT

Grumman received a contract on 27 November 1943 to build two prototypes, one to be powered by a Pratt and Whitney R-2800-22C and the other by the -22E version. The contract issued under priority conditions, as dictated by wartime exigencies, also called for a first flight date set within eight months. A mock-up of the cockpit was cleared by the following January while an engine installation mock-up was also accepted two months later.

As the 'E' engine had not yet become available both prototypes were fitted with the -22C and by June 1944 the existing contract was modified to include 23 other XF8F-1s (as the new fighter had been designated by that time); Grumman was also requested to start tooling for an expected production of 100 examples a month.

The roll-out of prototype number one (90460) took place at Bethpage, Long Island, (New York) in August, as scheduled, with the first flight being performed at the end of that month by Bob Hall. The XF8F-1 performed excellently and showed no serious vices, at least not anything that could not be solved within a reasonable time. A major concern was longitudinal stability, which was cured by adding 6 inches (15cm) to each tip of the horizontal tail surfaces.

Performance was so good that Grumman decided to put in a few additions of their own to their superb fighter. One of these was to increase the internal fuel tank from the specified 150 gallons to 183 on the production aircraft. Underwing hard points were also increased to carry up to two 1,000lb (450kg) bombs plus four more smaller points for 250lb (112kg) each.

In this form the first prototype went for evaluation at the Joint Fighter Conference of the Naval Air Test Centre at Patuxent River, in Maryland, where it was flown by a great number of service pilots apart from the usual military test pilots. The unanimous consensus was that this was a really superb fighter in every respect, and the XF8-1 was highly recommended for full scale service introduction in favour of the much larger aircraft then being developed and tested. The only questions raised concerned the four-gun armament, considered inadequate in some quarters, and the significant lack of longitudinal stability that was still dogging Grumman engineers, while the Navy added a few requests of its own for improvement and refinement.

FURTHER IMPROVEMENTS

The second prototype was ready in November. In the meantime Grumman had received a considerable boost to its original contract – this now called for 2,000 examples that were to have a six-gun armament (although this was soon dropped, and the four-gun configuration remained). The production of 100 aircraft a month was envisaged to be reached by mid-1945 with the complete change-over to the F8F and the closure of F6F production to take place by the end of that year. Another Grumman test pilot, Pat Gallo, performed the first flight of 90461, the second XF8F-1 on 2 December 1944. The following month this aircraft was used to test range characteristics – this, surprisingly, was a bit of a disappointment as the large P & W burned fuel at a tremendous rate. A manual mixture control was introduced that, however, complicated matters in other areas. One solution led to the creation of another problem and the story continued seemingly with no final solution.

By February the pilot assembly line was functioning and the first Bearcat was completed that same month. Not content with planned production schedules, the Navy signed a contract with General Motors (Eastern Division) for the production of 1,876 examples to be designated F3M-1s on 5 February 1945. These aircraft were to be powered by the P & W R-2800-34W engines. This engine was installed on the second pre-production aircraft in place of the -22 with positive results and was approved for installation in all Bearcats in production. Other

Grumman F8F-1 Bearcat, BuNo.94860, '2', Blue Angels US Navy Aerobatic Team, 1946. Blue Angels Blue overall (FS.15050) with gold lettering and numbers; note: US Navy is repeated below both wings, reading from trailing edge
Below: Grumman F8F-1, BuNo.95187, '0', 'Beetle Bomb', flown by the soloist of the US Navy aerobatic team Blue Angels, 1949. Golden Yellow overall with dark blue lettering and numbers; Silver Corogard to leading edges of all flying surfaces. 'U.S.NAVY' repeated below both wings, reading from trailing edge. Aircraft crashed during a display at Whiting Field on 24 April 1950, killing the pilot

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Above: Grumman F8F-1 Bearcat, BuNo.95081, 3F4-4, flown by Lt A.M. 'Mike' Granat of VF-3, early 1946. Glossy Sea Blue overall (ANA 623) with all lettering and numbers in white; US national markings in white only on fuselage sides, above port and below starboard wings. Unit badge on cowling.
Below: Grumman F8F-2 Bearcat, BuNo.95318, 201-B, flown by Lt Cdr Caldwell, Air Group Commander VF-19, USS Boxer. Standard finish with '201B' repeated above starboard and below port wings. '201' on nose repeated on main undercarriage door; pilot's name in white below cockpit. Ribbons on engine cowlings

Grumman F8F-1 Bearcat, BuNo.115447, 13-L, US Naval Air Reserve Akron (Ohio), 1951. Glossy Sea Blue overall (ANA 623) with all lettering an numbers in white; Yellow-Orange rear fuselage band. US national markings in standard positions; '13L' repeated in white above starboard wing.
See scrap view for wing underside markings.

Grumman F8F-1 Bearcat, BuNo.94860, 3-V, Naval Air Reserve, Glenview (Illinois), 1950. Glossy Sea Blue overall (ANA 623) with lettering and numbers in white; Yellow-Orange rear fuselage band. '3' repeated on front of cowling and on mainwheel doors; '3V' repeated above starboard and below port wings. US national markings in standard positions

Grumman F8F-1D Bearcat, BuNo.90456, 456 Drone Control Aircraft, United States Navy. Glossy Sea Blue (ANA 623) fuselage with yellow wings, vertical tail surfaces and fin; red rudder and chordwise bands around wings. White code and serial; US national markings in standard positions

Grumman F8F-2 Bearcat, BuNo.121730, 105-A, VF-151, USS Boxer (CV-21), 1951. Standard finish; yellow/red striping on rudder trim tab and rear fuselage. Red fin/rudder top; '105A' in white repeated above starboard and below port wings. US star marking in white/red on fuselage sides, above port and below starboard wings. '105' repeated on nose and on main undercarriage doors

Grumman F8F-1B Bearcat, BuNo.95492, 'S', G.C. I/9 'Limousin', Cat-Bi (Vietnam), 1951. Glossy Sea Blue overall (ANA 623) with national markings in six positions; white 'S' on nose and fin, the latter within a red disc. White serial at base of fin; note different badges on engine cowling, port and starboard

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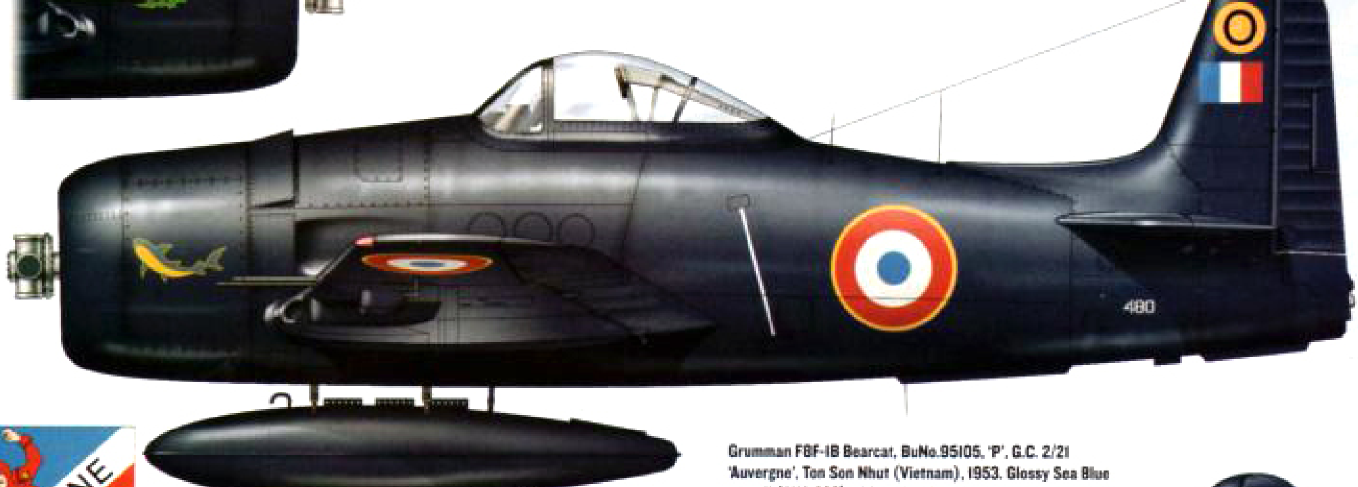
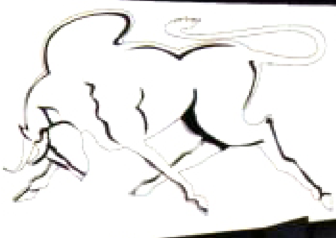
Grumman F8F-1B Bearcat, BuNo.121480, 'O', G.C 2/8 'Languedoc', Cat-Bi (Vietnam), 1953. Glossy Sea Blue overall (ANA 623) with national markings in six positions; black 'O' within a yellow disc on fin. White serial below tailplane; note different badges on engine cowling, port and starboard

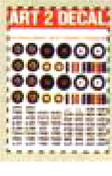


Grumman F8F-1B Bearcat, BuNo.95105, 'P', G.C. 2/21 'Auvergne', Ton Son Nhut (Vietnam), 1953. Glossy Sea Blue overall (ANA 623) with national markings in six positions; yellow code 'P' on fin, white serial. Unit badge on both sides of engine cowling

Grumman F8F-1 Bearcat, 1232/125, 12th Fighter Squadron, 1st Fighter Wing, Don Muang, 1954. Glossy Sea Blue overall (ANA 623) with national markings in six positions; white rear fuselage band, edged in black. Light blue stars on fin and rudder; white serial and code. Unit badge on fuselage sides; '1232' repeate d in white below wings, reading from leading edge below port and from trailing edge below starboard



Grumman F8F-1 Bearcat, '2335', 23rd Squadron, 2nd Wing, Royal Thai Air Force, Nakhon Sawan, 1955. Glossy Sea Blue overall (ANA 623) with yellow decoration on rear fuselage and tail; white rear fuselage band and serial on engine cowling. White bull marking on both sides of the fuselage; national markings in six positions



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Grumman F8F-I Bearcat, 2300, 23rd Squadron, 2nd Wing, Royal Thai Air Force, Khokratiem, 1956. Aluminium overall with black anti-dazzle panel; yellow/Glossy Sea Blue overall (ANA 623) tail decoration. Black serial on engine cowling, repeated below wings, reading from leading edge below port and from trailing edge below starboard; white rear fuselage band, edged in black. Unit badge on fuselage sides; note Sea Blue Gloss external fuel tank

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Grumman F8F-I Bearcat, 2200, 22nd Fighter Squadron, 2nd Fighter Wing, Royal Thai Air Force, Chaing Mai, 1954. Glossy Sea Blue overall (ANA 623) with national markings in six positions; white rear fuselage band, serial on cowling and checks on vertical and horizontal tail surfaces. 'Bull' badge on fuselage sides, golden bird badge on fin, both sides

Grumman F8F-I Bearcat, BuNo.095338, 'E', 1st Fighter Squadron, Republic of Vietnam Air Force, Binh Hao, 1963. Aluminium overall with black anti-dazzle panel, cockpit frame and area around echaust stacks; national markings in six positions. Code and serial in red on fin; 514th Fighter Squadron badge on engine cowling

Grumman F8F-IB Bearcat, 121510-G, 1st Fighter Squadron, Republic of Vietnam Air Force, 1956. Glossy Sea Blue overall (ANA 623) with national markings in six positions; code and serial in yellow on fin. 514th Fighter Squadron badge on engine cowling

Left: Very close formation flying courtesy of VF-9A's F8F-1s some time in 1948. Very unusual is the small, pointed spinner fitted to the propeller hub on these aircraft *(R.J. Caruana Archives)*

tests included armament trials with 'Tiny Tim' rockets and serious studies for the replacement of the 12.7mm machine guns with 20mm cannon.

THE BEARCAT GOES TO SEA

17 February 1945 marked the first outing of the F8F at sea. No less than nine deck take-offs and landings were performed from USS Charger, as two NAAS pilots performed the flights that were described as extremely satisfactory. These were followed by catapult trials at Mustin Field.

By 1 April, the number of pre-production aircraft involved in a number of trials increased. Teething problems continued to develop during these highly stringent tests, none of which were of any consequence on the vast production of the new fighter that was gaining momentum by that time. One very significant aspect is the fact that, notwithstanding the introduction of numerous modifications, the Bearcat remained well within the prescribed weight limit. During that month Grumman received another order for an additional 2,000 fighters with the first service deliveries scheduled for May of the same year.

VF-19 of the United States Navy (USN) received the first example at NAAS Santa Rosa, California, on 21 May 1945 and the unit was immediately involved in a concentrated effort to have the type reach operational status within that summer. A serious problem cropped up with a complete loss of engine power on at least five occasions during that training period; luckily all landings were performed without the Bearcats sustaining any damage.

Meanwhile 100 F8F-1s on order were requested to have 20mm cannon installed. Another important development at this stage was the F8F-1N night fighter version, with the application of a AN/APS-19 radar pod under the starboard wing pylon.

TOO LATE FOR ACTION

VF-19 was ready for operational service by the end of July and on 2 August 1945 embarked on USS Langley. VF-18 followed with the Bearcat re-equipment programme, receiving F8Fs surplus from VF-19's requirements. By the time the Bearcat was sailing out for its first taste of action the Second World War ended with the collapse of Japan in mid-August. An immediate result was the cancellation of the entire order placed with General Motors for the F3M while the 4,000 F8F-1 Bearcat order was heavily trimmed down to a total of 770, including all pre-production examples. Likewise, production rate fell to about a fifth of that originally planned and was eventually to fall even lower to some 15 examples per month.

Notwithstanding these heavy cuts in orders the Bearcat's future was still secured and the Navy saw in this fighter its best aircraft for the immediate post-war period. At this time the first F8F-1C with its four-cannon armament appeared for flight test evaluation. The next target for Grumman was to fit the P & W R-2800-30W 'E' engine into the F8F. With this installation an increase to the fin and rudder height of some 12 inches (30cm) was also introduced to improve stability. This seemingly simple tail extension was to create some complex problems that were only sorted out some two years later.

From early 1946 four more squadrons started to equip with the Bearcat and production rate doubled to 30 a month. The gun and cannon versions were being produced in parallel with a ratio of about 4:1 respectively, while the F8F-1C designation for the cannon fighter was changed to F8F-1B in March. By that time some modifications were also introduced to the wings at the 'break point', which had been the centre of considerable study after a fatality that occurred in December of the previous year.

By the end of 1946 the operational Bearcat squadrons had increased to nine but flight tests and mock combat with the Lockheed P-80 Shooting Star had shown in no uncertain terms that the future of aviation laid in the development of jet fighters and the days of piston-engined wonders – even of the likes of the Bearcat – were numbered. Still, by the end of the following year ten more squadrons were flying the Bearcat and the -30W engined version, designated F8F-2, was planned for introduction into production as from January of 1948.

As deliveries of the F8F-2 began, the Bearcat's presence with the US Navy had reached its peak of 24 squadrons during 1948, while during the following year the type's presence began to dwindle as the retired F8F-1s began a second existence, that of drone controls. The conflict in Korea that had erupted in the summer of 1950 gave new life to the F4F Corsair while the Bearcat fared badly; warfare had changed considerably as by then the need was for aircraft that could deliver heavy ordnance loads fast, a role for which the F8F was not considered suitable. This, compounded by the ever-increasing appearance of jet fighters, marked the swansong for this superb ship-borne aircraft.

EXPORTS

Ironically enough, while the Bearcat was not considered suitable by the USN for Korean operations the F8F found an operational role with a foreign operator. With the direct threat of Chinese intervention in Vietnam the French needed all the aircraft they could lay their hands on. F8F-1 and F8F-1B Bearcats for the formation of two squadrons were supplied to the French Expeditionary Force in Indo-China for a role that the USN had considered unsuitable, that of ground attack. The Bearcat gave a good account of itself and was called to perform all imaginable missions, from fighter to ground attack, photographic sorties etc.

Notwithstanding their excellent service in that theatre the Geneva agreement following the fall of Dien Bien Phu brought the withdrawal of the French forces, the surviving Bearcats being handed over to the fledging South Vietnamese Air Force with which this air arm was to form its first fighter squadrons.

More F8Fs were supplied to Thailand. Due to this Bearcats that were still in US service were retired, refurbished and handed over to this country where they remained in service well into the 'sixties. ■

Grumman F8F-2 Bearcat during trials at the National Air Test Center. Though compact, the Bearcat still retained a business-like appearance. *(R.J. Caruana Archives)*

Dornier Do 215B-1, G2+JH, 1.(F)/Aufkl. Gr 124, 1940. RLM 70/71/65 finish with black codes. Aircraft shot down off the Norfolk coast on 30 August 1940, whilst serving with 4.(F)/Aufkl. Gr Ob.d.Lr

Dornier Do 215B-1, T5+AC, 1.(F)/Aufkl. Gr Ob.d.L. Finland, July 1941. RLM 70/71/65 finish with Gelb 04 rear fuselage band and underside of wingtips; codes in black. Note: the fin marking does not appear on our photo used as reference

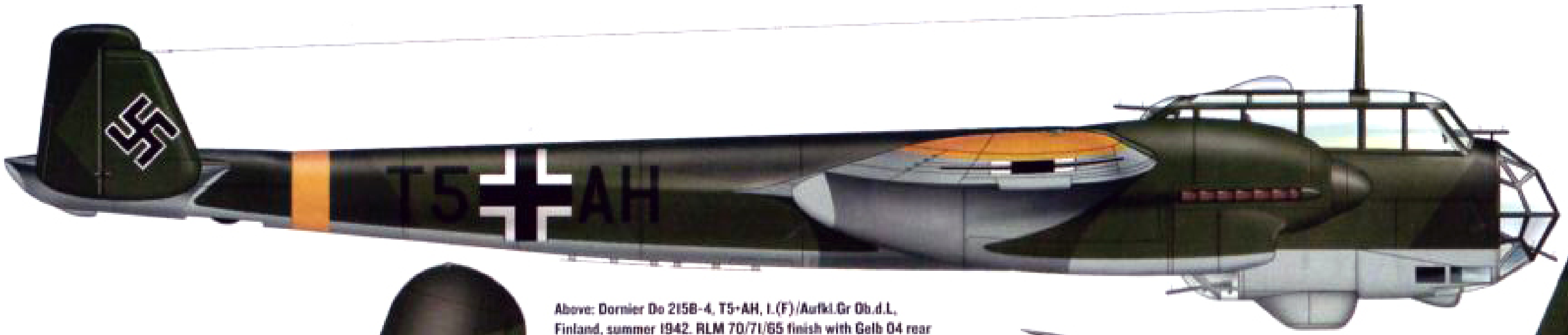
Dornier Do 215B-4, T5+BC, 1.(F)/ObdL, Russian Front, August 1941. RLM 70/71/65 finish with Gelb RLM 04 rear fuselage band and underside of wingtips; standard national markings. Code in black

Dornier Do 215B-4, L2+ES, W/Nr.0024, 3.(F)/Aufk.Gr Ob.d.L, 1942. RLM 70/71/65 finish with national markings in standard positions; code in black, except for 'E' which is in Rot 23. 'E' repeated in black below wings, outboard of national markings

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6



Above: Dornier Do 215B-4, T5+AH, 1.(F)/Aufkl.Gr Ob.d.L, Finland, summer 1942. RLM 70/71/65 finish with Gelb 04 rear fuselage band and underside of wingtips; code in black

Right: Typical Luftwaffe upper surface camouflage pattern and markings

Below: Dornier Do 215B-4, F.707, 2nd Air Brigade, 1st Independent Tactical Reconnaissance Group, 1st Squadron, Hungarian Air Force, 1942. RLM 70/71/65 finish (RLM 70/71 mottles applied also on the undersides) with Gelb 04 band around rear fuselage and underside of wingtips; green/white/red fins/rudders (both faces) and tailplane (above and below). National markings in standard positions; code in black. Unit badge on forward fuselage

Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

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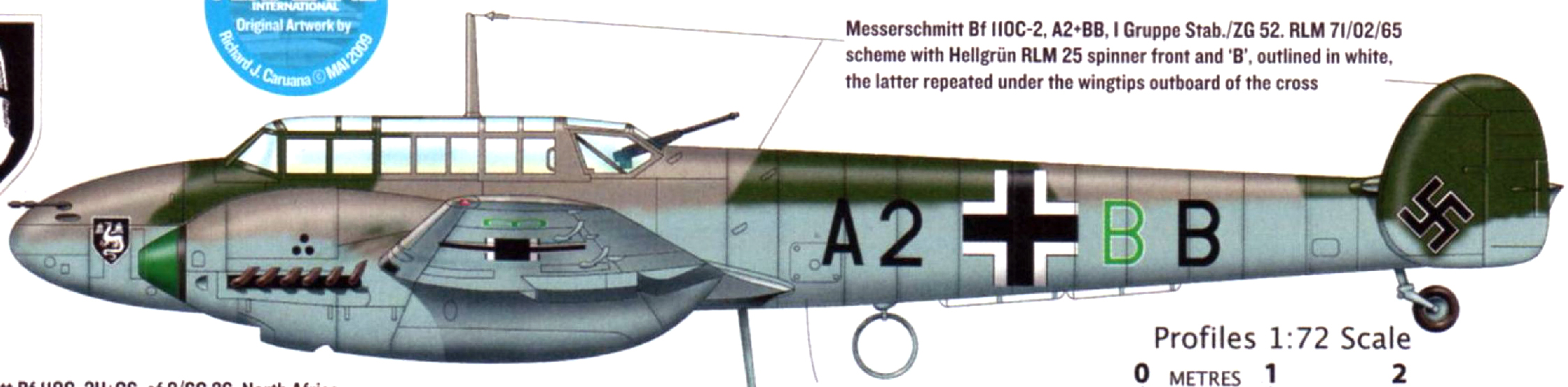
Messerschmitt Bf 110C-2, A2+BB, I Gruppe Stab./ZG 52. RLM 71/02/65 scheme with Hellgrün RLM 25 spinner front and 'B', outlined in white, the latter repeated under the wingtips outboard of the cross

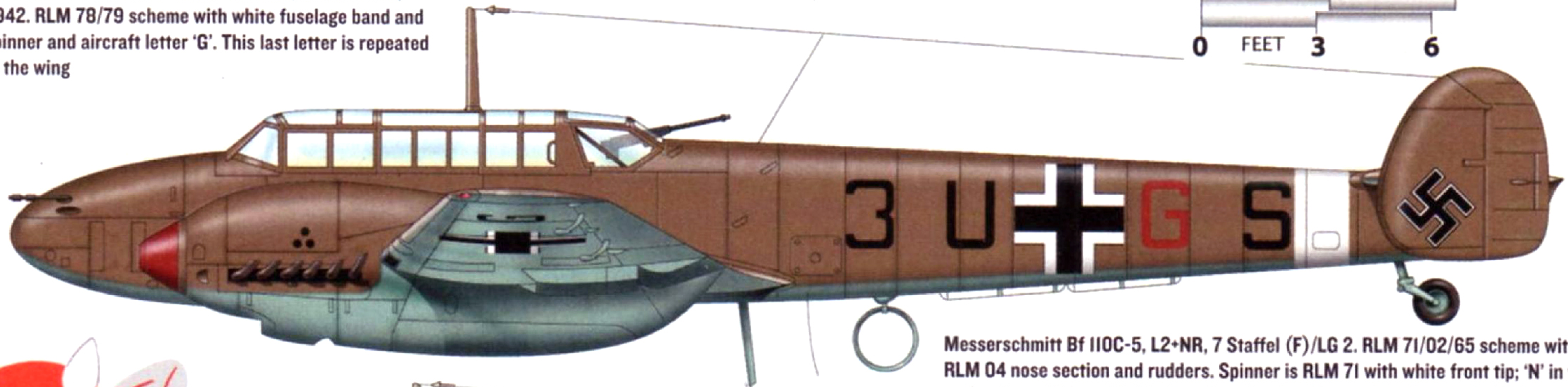


Profiles 1:72 Scale

0 METRES 1 2

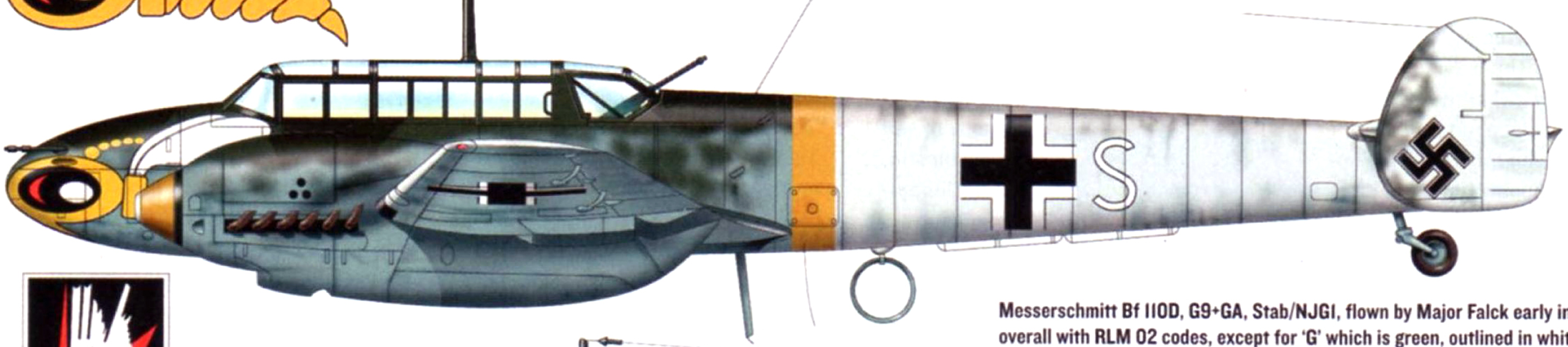
0 FEET 3 6

Messerschmitt Bf 110C, 3U+GS, of 8/SG 26, North Africa, late 1942. RLM 78/79 scheme with white fuselage band and red spinner and aircraft letter 'G'. This last letter is repeated below the wing

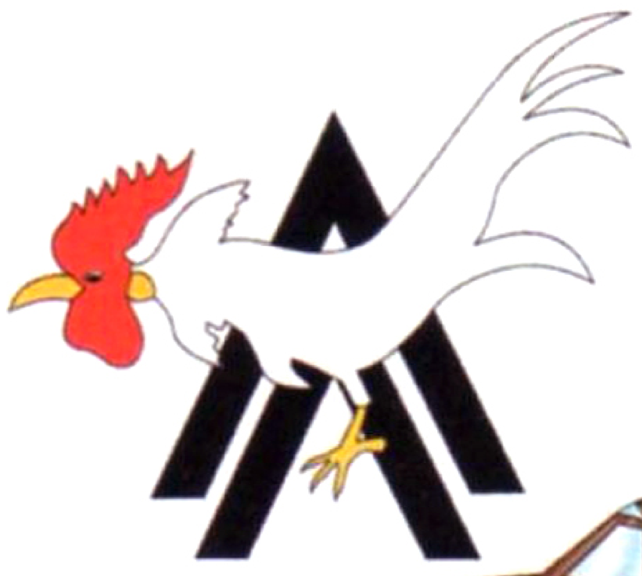


Messerschmitt Bf 110C-5, L2+NR, 7 Staffel (F)/LG 2. RLM 71/02/65 scheme with Gelb RLM 04 nose section and rudders. Spinner is RLM 71 with white front tip; 'N' in white on fuselage sides and in black under wingtips. Note unit badge partly hidden behind the spinner; the grey areas in the badge are, in actual fact, silver

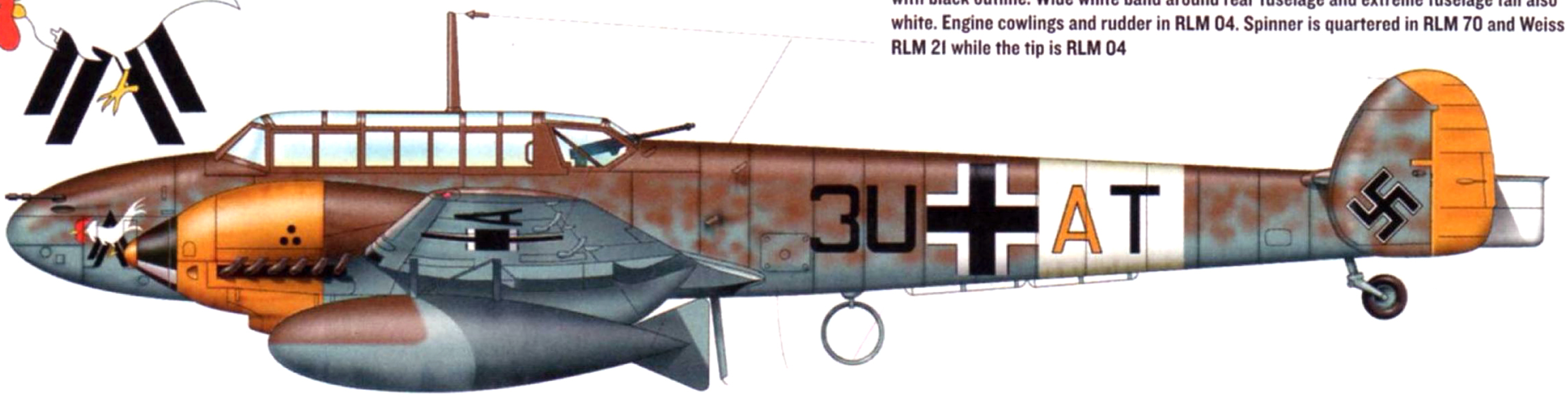
Messerschmitt Bf 110C-4/B, S9+SM, II SKG 210, Russian Front. RLM 70/71/65 scheme with temporary white distemper overpaint of upper wing surfaces and complete rear fuselage and tail section; Gelb RLM 04 fuselage band and spinner, the latter having a white tip and RLM 70 rear section. Wasp marking over most of the nose area



Messerschmitt Bf 110D, G9+GA, Stab/NJG1, flown by Major Falck early in 1942. Black overall with RLM 02 codes, except for 'G' which is green, outlined in white; national markings in white only. Gelb RLM 04 band around rear fuselage



Messerschmitt Bf 110E-2, 3U+AT, 9./ZG.26, Sicily, 1941. RLM 79 Sandbraun on all upper surfaces and mottling on fuselage sides over RLM 65 undersides. 'A' of code is RLM 04 with black outline. Wide white band around rear fuselage and extreme fuselage tail also white. Engine cowlings and rudder in RLM 04. Spinner is quartered in RLM 70 and Weiss RLM 21 while the tip is RLM 04



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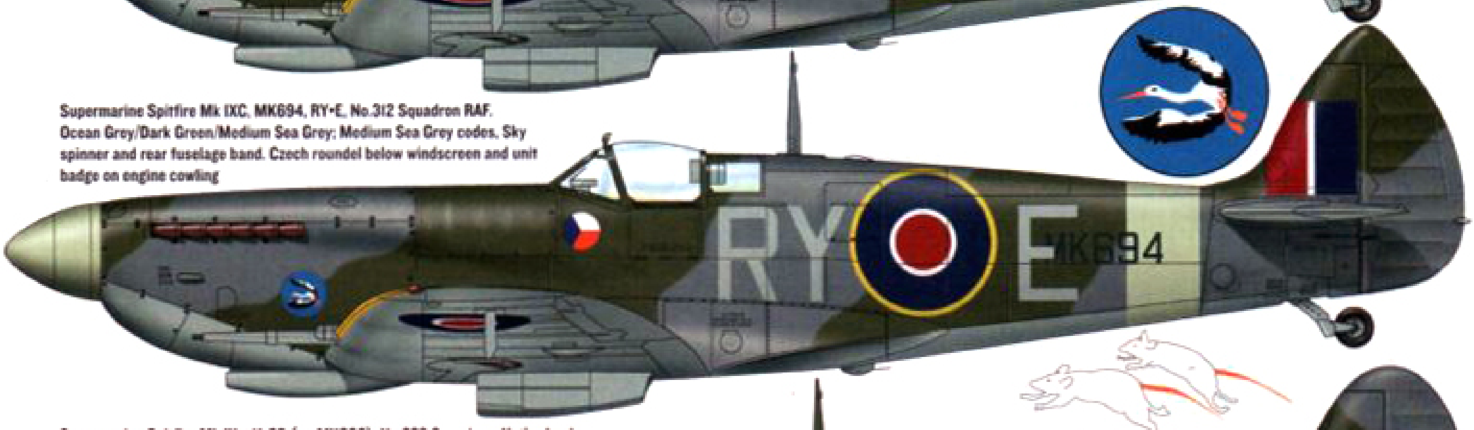
Supermarine Spitfire LF Mk IXc, PT396, EJ•C, flown by Wg Cdr 'Jack' Charles RCAF, CO Tangmere Wing, 1944. Ocean Grey/Dark Green/Medium Sea Grey; Sky spinner, rear fuselage band and codes. Night/white bands around wings and rear fuselage. Command pennant under windscreen. Charles scored a total of 15 victories, including Biggin Hill's 1000th

Supermarine Spitfire Mk IXc, EN315, ZX•6, No.145 Squadron RAF, flown by Sqn Ldr S. Skalski. Dark Earth/Mid-Stone/Azure Blue. Red spinner, red codes outlined white; Polish flag (reversed) and five white 'kills' below windscreen

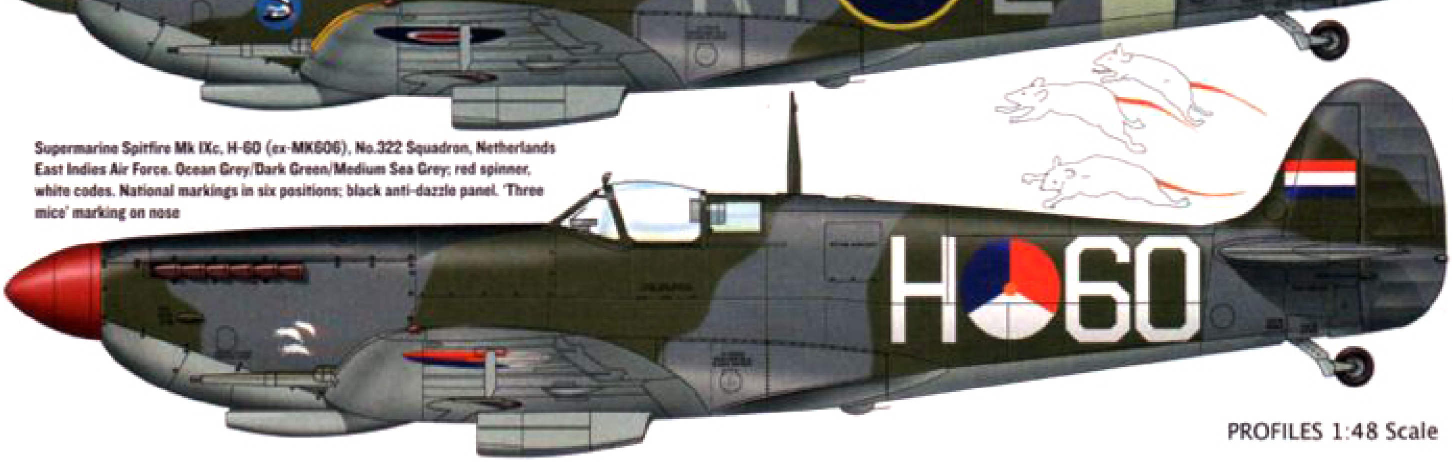
Supermarine Spitfire Mk IXc, EN199, HT•U, flown by Flt Sgt E. Artus, No.154 Squadron, Ta' Qali (Malta), July 1943. Dark Earth/Mid-Stone/Azure Blue. Night spinner, white codes. Artus was credited with a Bf 109 and a probable on 17 July 1943

Supermarine Spitfire Mk IXc, RK855, FT•C, No.43 Squadron RAF, Austria, 1946. Dark Green/Ocean Grey/Medium Sea Grey. Bright red spinner and codes, edged in white. Sky rear fuselage band and black/white chequers on top of fin. Upper wing roundel is Type 'C'

Supermarine Spitfire Mk IXC, MK694, RY•E, No.312 Squadron RAF. Ocean Grey/Dark Green/Medium Sea Grey; Medium Sea Grey codes, Sky spinner and rear fuselage band. Czech roundel below windscreen and unit badge on engine cowling



Supermarine Spitfire Mk IXc, H-60 (ex-MK606), No.322 Squadron, Netherlands East Indies Air Force. Ocean Grey/Dark Green/Medium Sea Grey; red spinner, white codes. National markings in six positions; black anti-dazzle panel. 'Three mice' marking on nose



PROFILES 1:48 Scale

Blackburn Skua Mk II, L2887, A7F, No.803 Naval Air Squadron, HMS Ark Royal, 1939. Aluminium paint (silver) overall with blue/red bands around fuselage; red wingtips. Two blue bars across fin; serial in black, code in white

PROFILES 1:48 Scale
Metres 0 1 2
0 3 6

Blackburn Skua Mk II, L2912, No.801 Naval Air Squadron, HMS Furious, autumn 1940. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky Grey undersides and vertical tail surfaces; Night serial, Blue/Red roundels above wings

Blackburn Skua Mk I, L3007, 6M, No. 600 Naval Air Squadron, HMS Ark Royal, summer 1940. Extra Dark Sea Grey/Dark Slate Grey upper surfaces; lower fuselage sides and vertical tail surfaces in Sky Grey. Undersides repainted in Sky; Night code, outlined in white. Blue/Red roundels above wings, none below. '6M' in black, thinly outlined in white on wing leading edges (see scrap view)

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HISTORICAL FEATURE
70th ANNIVERSARY OF THE START OF WWII

Models
Do 17E-1 - [1:48] Hobbycraft #HC1604, [1:72] Airfix #04014/a04015
Do 17Z - [1:48] Hobbycraft #HC1602 & Classic Airframes #4114, [1:72] Frog #F205 & Monogram #6842
Ju 52/3m - [1:48] Revell-Monogram #85-5944, [1:72] Italeri #101
Ju 87B - [1:48] Hasegawa #JT13, [1:72] Fujimi #7A-F13 & Italeri #079
He 111B - [1:72] Roden #0005

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J Caruana © MAI 2003

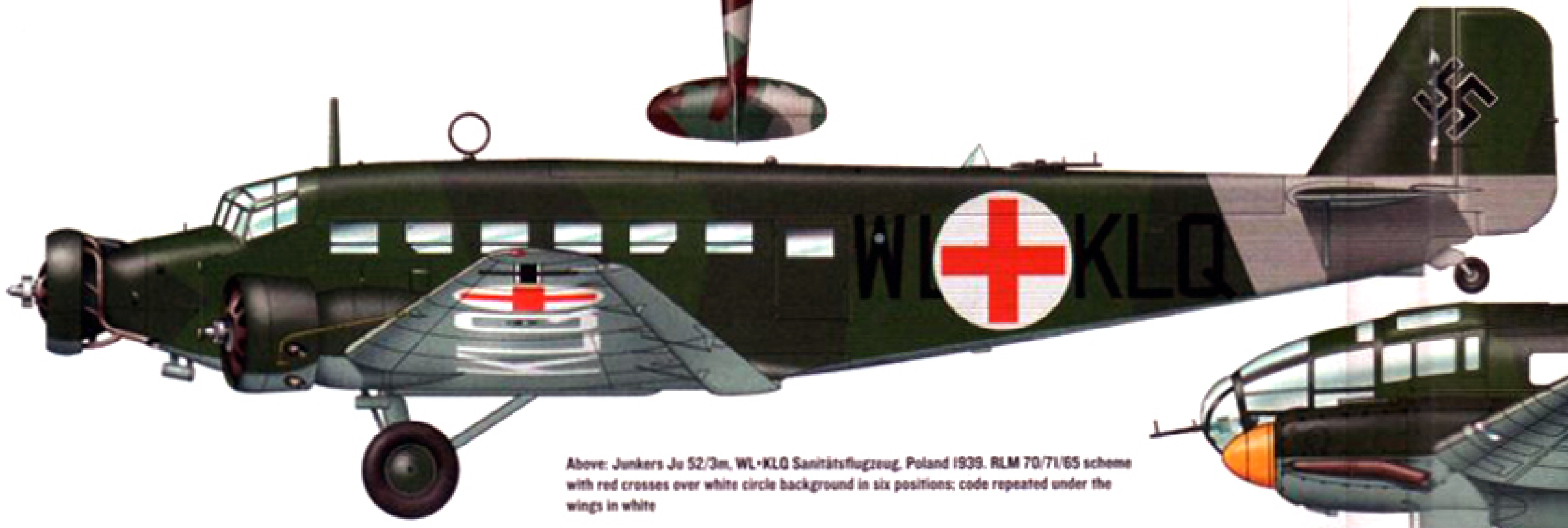
FALL-WEISS

The Invasion of Poland – The Start of World War II

Dornier Do 17E-1, 3Z+BK, I./KG 77, September 1939. RLM 61/62/63 upper surfaces with RLM 65 undersides; red spinners and 'B' of code. Rest of code in black

Dornier Do 17E-1, 3Z+FR, I./KG 77, first German aircraft shot down during WWII, by Plt Off. Wladyslaw Gnys, close to Olkusk, 1 September 1939. RLM 61/62/63 upper surfaces with RLM 65 undersides; Gelb 04 around nose. Black code with white 'F', the latter repeated in black below wings; unit badge on nose

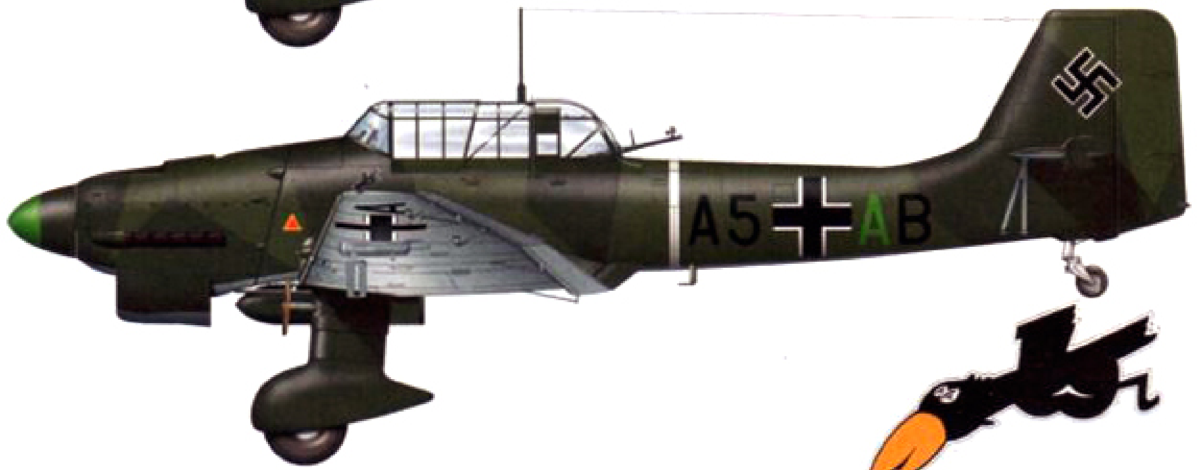
Above: Dornier Do 17Z-2, 5K+FD, Stab III Gruppe, KG 3 'Blitz', Heiligenbeil, East Prussia, September 1939. RLM 70/71/65 finish with blue spinner front; code in black with blue 'F', outlined in white. 'Four Aces' marking on forward fuselage



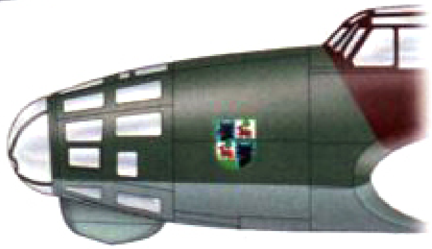
Above: Junkers Ju 52/3m, WL+KLQ Sanitätsflugzeug, Poland 1939. RLM 70/71/65 scheme with red crosses over white circle background in six positions; code repeated under the wings in white

Junkers Ju 87B-1, 2./StG 1, September 1939. RLM 70/71/65 finish; codes in black, with 'A' in white outline. 'Peter' in white on wheel spat

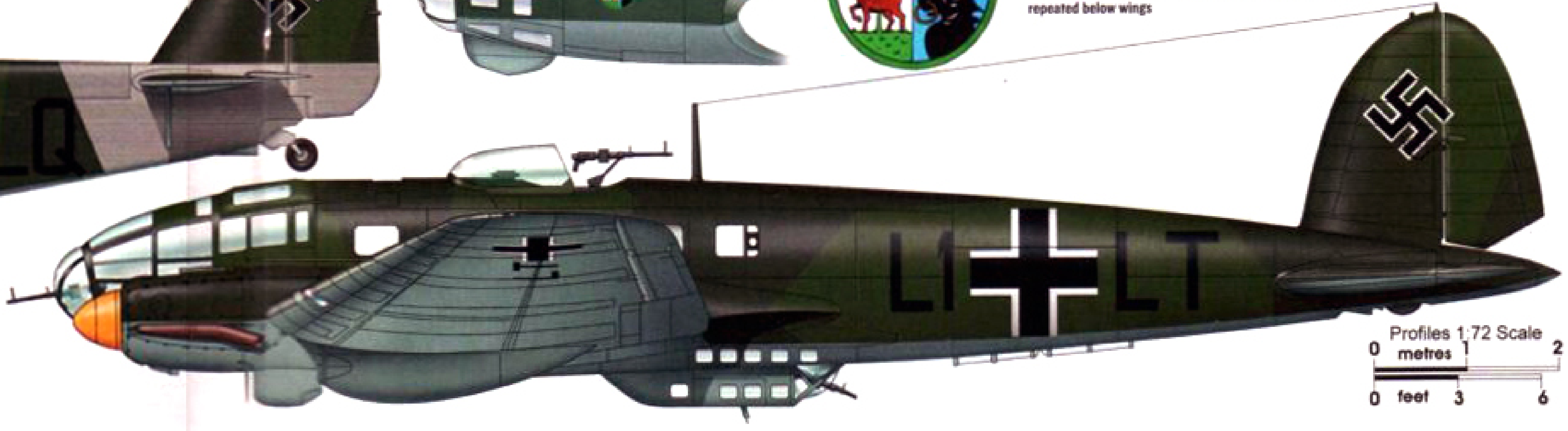
Ju 87B-1, A5+AB, I./StG 1, September 1939. RLM 70/71/65 finish with white band around rear fuselage; black code, with 'A' and front of spinner in bright green. 'A' repeated below wingtips in black; unit badge below windscreen



Below: Heinkel He 111B-2, V4+AB, KG-1 'Hindenburg', September 1939. RLM 61/62/63 upper surfaces with RLM 65 undersides; red band across tail with black swastika over a white disc. Code in black; unit badge on nose (see position in scrap view below). For upper surface pattern see far left



Below: Heinkel He 111H-1, III./LG 1, September 1939. RLM 70/71/65 finish with yellow spinners; black codes, with 'LT' repeated below wings



Models
Bf 110C - [1:48] Eduard #8201, [1:72] Fujimi #7A-16
Bf 109D - [1:48] Hobbycraft #HC1568, [1:72] Heller #101
Bf 109E-1 - [1:48] Hasegawa #09369, [1:72] Academy #1668

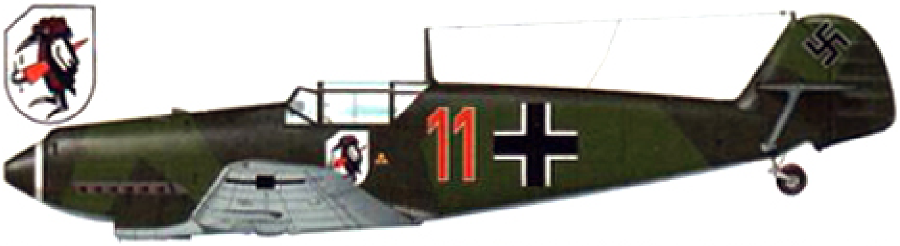
Messerschmitt Bf 110C-1, L1+DY, I.(Z)LG 1, September 1939. RLM70/71/65 finish with red/white spinners; black code with 'D' in red, outlined in white. White wingtips; nose marking includes a 'kill' with '1939' above it in white

Messerschmitt Bf 110C, M8+DK, 2./ZG 76, September 1939. RLM70/71/65 finish with red/white spinners; black code with 'D' in red, outlined in white. 'D' repeated in black below wingtips

Messerschmitt Bf 109D-1, 'White 2', reported as being in service with I./ZG.2 (though carrying the markings of I./JG 137) during the Polish Campaign, 1939. RLM70/65 finish with white front of spinner; black/white/black fuselage band. White '2' on fuselage; badges on cowling and below windscreen

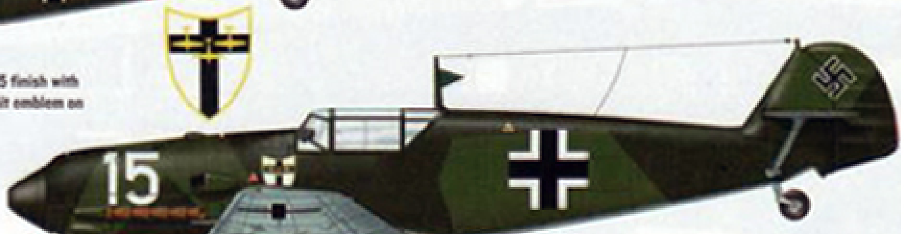
Messerschmitt Bf 109D-1, 'Yellow 12', flown by Oblt Josef Steinmetz-Kellner, 3./JG 102, September 1939. RLM 70/71/65 finish with two narrow white bands around rear fuselage; yellow '12' outlined in black. Yellow front of spinner

Messerschmitt Bf 109D-1, W.Nr.2621, flown by Maj. Hannes Gentzen, CO of JG 102, Lachen-Speyerdorf, October 1939. RLM 70/71/65 finish with white rank chevron markings, outlined in black; tally of six kills on fin in white. Unit badge below windscreen. Gentzen had participated in the Polish campaign flying this aircraft

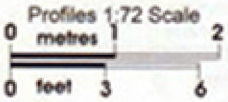


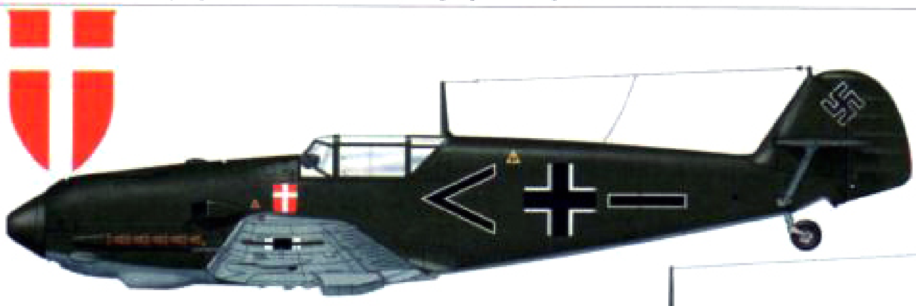
Messerschmitt Bf 109D-1, 'Red 11', 2./JG 71, September 1939. RLM 70/71/65 finish with red '11', outlined in white; white spinner backplate. Unit badge below cockpit. This unit was stationed at Fürstenfeldbruck to protect Munich in case of a Polish counter-attack

Messerschmitt Bf 109E-1, W/Nr.4172, 'Red 1', 2./JG 77, flown by Staffelkapitän Oblt Hannes Trautloff, September 1939. RLM 70/65 finish with early style crosses on fuselage and wing upper surfaces. All markings red, outlined in white, as is the bar on spinner. Personal marking is in white without the black outline as shown on the enlarged version



Messerschmitt Bf 109E-1, 'White 15', JG.27, September 1939. RLM 70/71/65 finish with white '15' on engine cowling; standard national markings for the period. Unit emblem on both sides of the fuselage





Messerschmitt Bf 109E-1, flown by Oblt Erwing Bacsila, II./ZG 1, Fürstenwalde, September 1939. RLM 70/65 finish with rank chevron in black/white on fuselage; personal emblem below windscreen

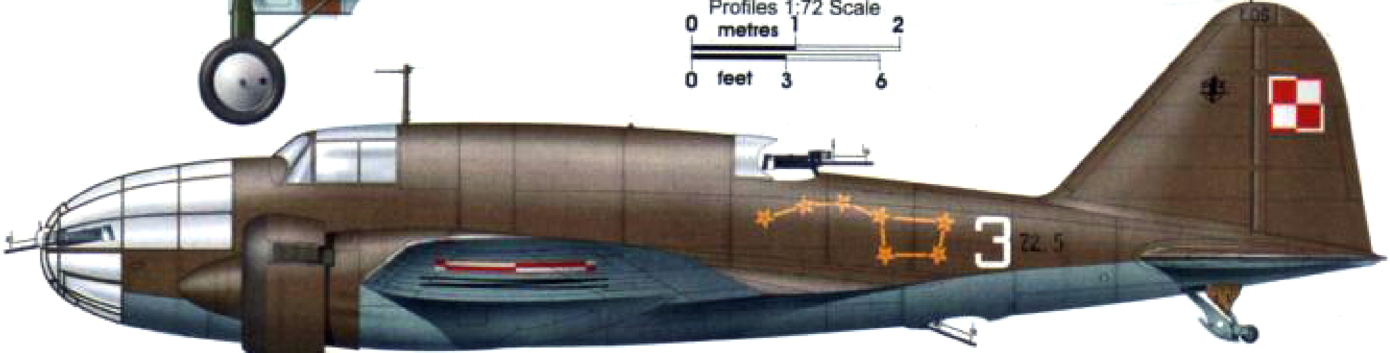
Fieseler Fi 156C-0, WL+1106, unkown unit, September 1939. RLM 70/71/65 finish with markings on fuselage, above wings and on rudder without white backing; code in black

BELOW: Avia B.534-III, '54', from one of the two Slovak Air Force units that operated alongside the Luftwaffe, September 1939. Olive Khaki upper surfaces with Light Blue undersides; marking on fin also carried above top and below bottom wings. German-style crosses on fuselage sides and above top wing, inboard of national marking. White '54' on fuselage sides

Below: PZL P.37A Łoś, 72.5/3, 212th Bomber Flight, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; code in white, serial in black. 'Great Bear' constellation marking in yellow on fuselage sides. Aircraft destroyed during bombing raid on Malaszewicse airport

Centre: PZL P.37A Łoś, 72.12, 12th Bomber Flight, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; black serial. Note newly modified mid-ship window still unpainted. Destroyed on 4 Setpember 1939 at Kuciny airfield

Profiles 1:72 Scale
0 metres 1 2
0 feet 3 6



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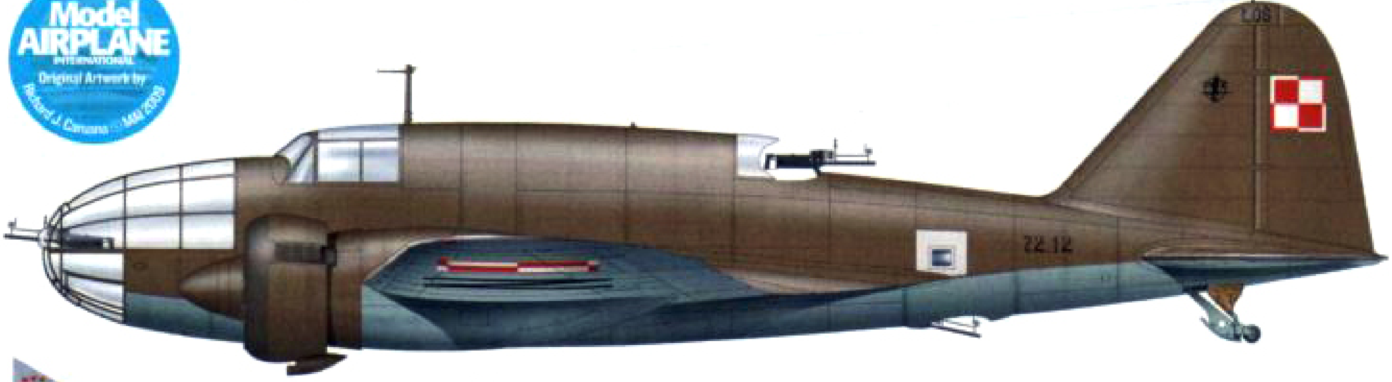
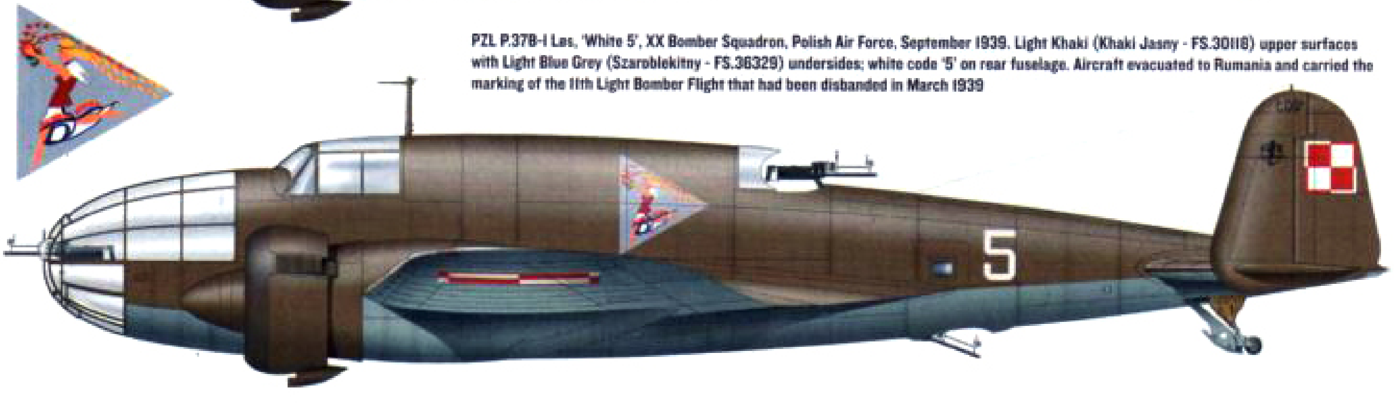


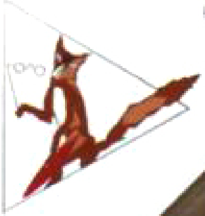
PZL P.37B-I Łoś, 'White 5', XX Bomber Squadron, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; white code '5' on rear fuselage. Aircraft evacuated to Rumania and carried the marking of the 11th Light Bomber Flight that had been disbanded in March 1939



Models
PZL P.37 - [1:48] Mirage Hobby #48131 & 48132, [1:72] ZPTS Plastyk
#S-04
PZL P.23 - [1:48] Mirage Hobby #481305, [1:72] Heller #247

PZL P.37B-II Łoś, 72.225/3, XX Light Bomber Squadron, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; white code, black serial. Badge of 12th Light Bomber Flight on fuselage sides. Destroyed at Malaszewicze airfield during a bombing raid

PZL P.23B, 44.86/98-K/DI, No.22 Squadron, 2nd Air Regiment, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides. Serial (44.86) in red on lower rear fuselage; code '98' in white below starboard wing, 'K' below port (see scrap view below right)



PZL P.23B, 44.188/112-N/9, No.12 Squadron, 1st Air Regiment, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; red serial (44.188) on lower rear fuselage. White code '112' below starboard wing, 'N' below port wing

Scrap views of wing underside at bottom shows how the white of the national marking was removed

Above: PZL P.23B, 44.102/146-C/I, flown by Kpt. Obs. Jozef Ludwik Skibinski of No.55 Squadron, 4th Air Regiment, Polish Air Force, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; white code I on fin. Black underwing code, with '146' below starboard and 'C' below port. Standard national markings, except for those below wings which are in red only

PZL P.23B, 'I', No.64 Squadron, 6th Air Regiment, Polish Air Force, Lwow, September 1939. Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides; national markings below wings in red only; white code 'I' on fin. Unit badge on fuselage sides. Aircraft flown by Squadron Commander Alfred Peszke

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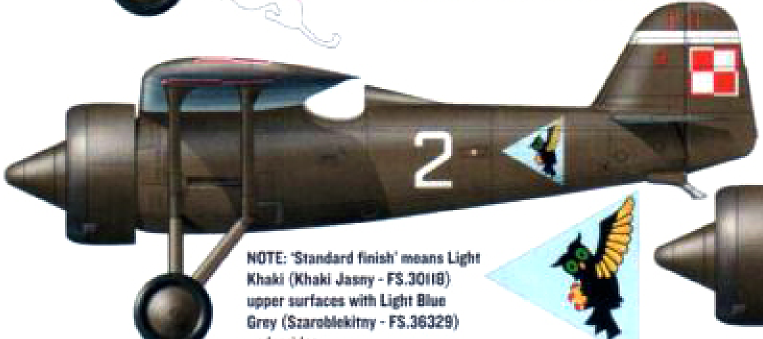
PZL P.7a, 6.133/10, No.162 Squadron, 6th Air Regiment, Lodz, September 1939. Standard finish; white code '10', black serial. Unit badge on fuselage sides

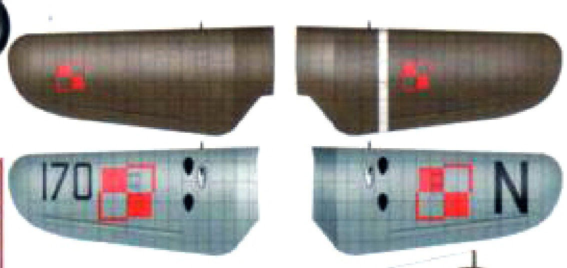
PZL P.7a, flown by 2nd Lt Erwing Kawnik, No.123 Squadron, Warsaw-Okejcie, Warsaw (north), September 1939. Standard finish; white angled bands around rear fuselage. Code '281' carried below starboard wing, and 'K' below port, both in black and reading from trailing edge

PZL P.11a, 'White 2', No.113 Squadron, VI/I Division of the 1st Air Regiment, Warsaw (north), September 1939. Standard finish. Underwing code '62' below starboard and 'N' below port, in black, reading from trailing edge.



PZL P.11a, 7.47/7, No.112 Squadron, III/I Division of 1st Air Regiment, Warsaw (north-east), September 1939. Standard finish; white code '7', black serial. Underwing code '58' below starboard and 'N' below port, in black, reading from trailing edge

NOTE: 'Standard finish' means Light Khaki (Khaki Jasny - FS.30118) upper surfaces with Light Blue Grey (Szaroblekitny - FS.36329) undersides

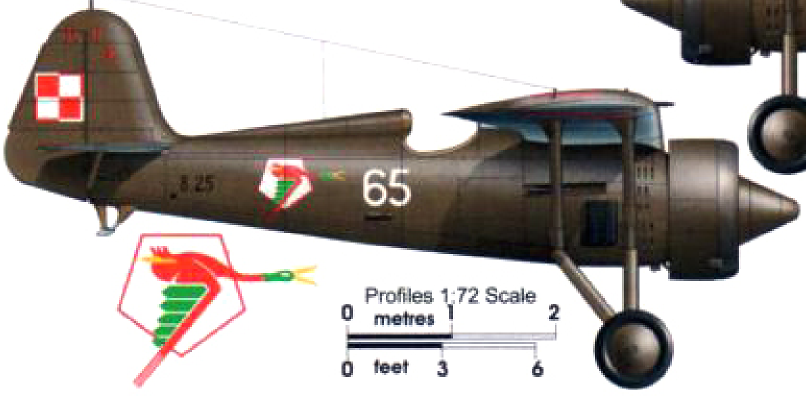


Above: PZL P.11c, 8.79/10, flown by Hieronim Dudwal, No.113 Squadron, IV/I Division, Warsaw (north), September 1939. Standard finish; code in white, serial in red. ; white cordwise band above starboard wing. See scrap wing views for details. Dudwal was credited with four Luftwaffe kills (Bf 110, He 111, Ju 86, He 126); eventually aircraft captured by the Germans when found abandoned at Poniatowa airfield.

PZL P.11c, 8.49/8, No.111 Squadron, Polish Air Force, September 1939. Standard finish; white '8', red serial. Unit badge on fuselage sides

PZL P.11c, White 4 (serial unknown), flown by Lt Jan Dzwonek, No.161 Squadron, 6th Air Regiment, Lwów, September 1939. Standard finish; white code '4'. Badge is carried on starboard side only; national markings below wings in red only

Above: PZL P.11c, 8.110/4, flown by L.Cpl Stanislaw Brzeski, No.152 Squadron, 5th Air Regiment, Lida, September 1939. Standard finish; white code '4', red serial. Unit badge on fuselage sides; no markings below wings



Left: PZL P.11c, 8.25/65, No.142 Squadron, Markowo, September 1939. Standard finish; white code '65', black serial. Unit badge on fuselage sides; underwing code '65' below starboard, 'T' below port, in black

Profiles 1:72 Scale
0 metres 1 2
0 feet 3 6

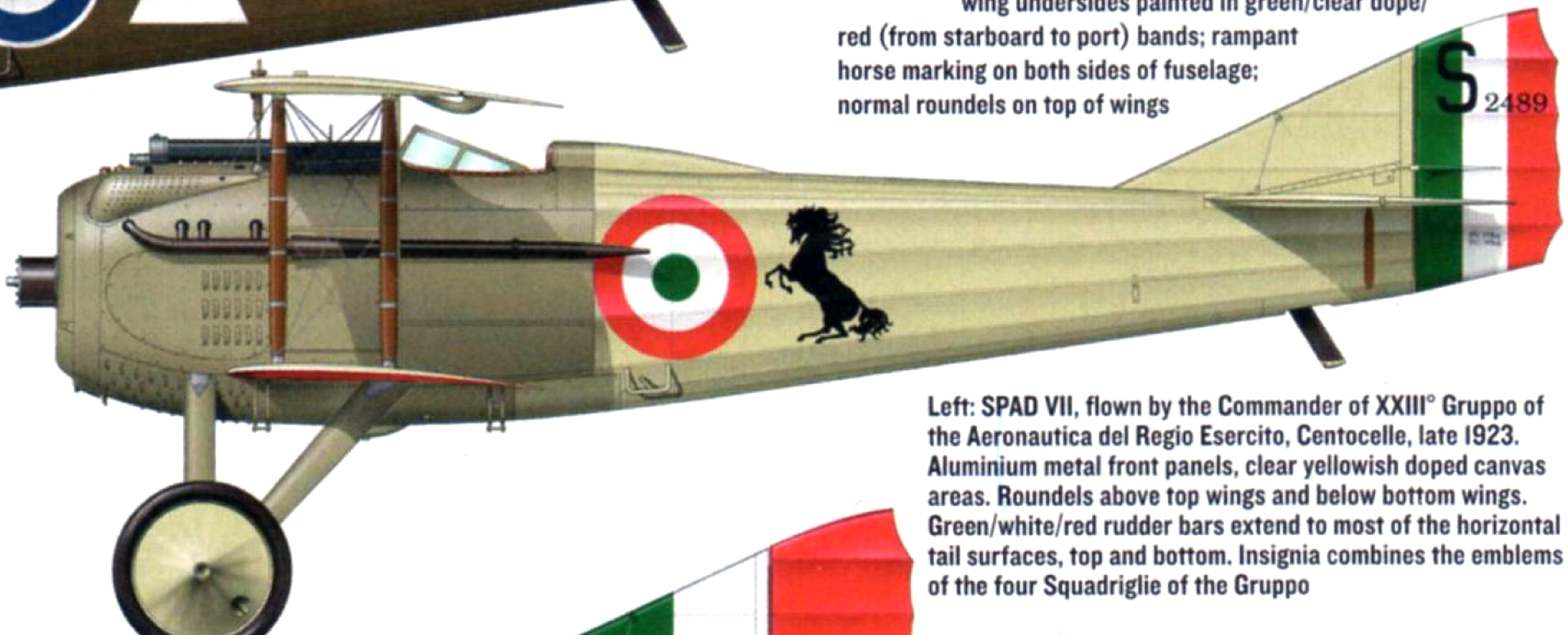
ART 2 DECAL All the unique marking artwork for all the profiles is available to download from our website [www.modelairplaneinternational.com] so that you can produce these options as decals using the numerous ink jet printer compatible decal papers now available

SPAD VII, 201, of SPA-48, 1917. Light yellowish dope overall with beige front fuselage section. 'Cockerel' faces forward both sides of fuselage; note 'I' repeated on top fuselage decking

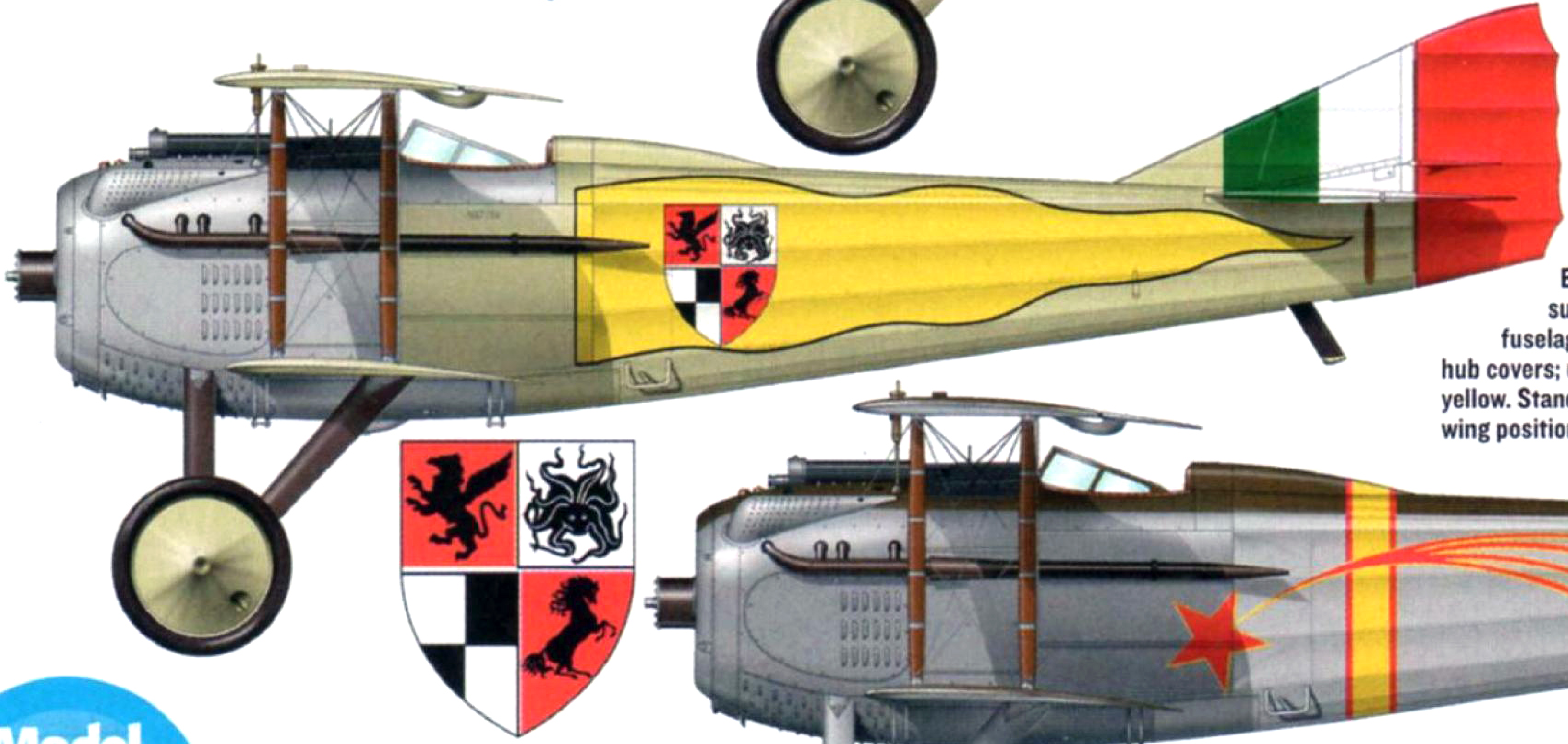
Below: Spad VII, S3198/S, of Escadrille SPA 124, Escadrille Lafayette, flown by Robert Soubrian. Vert Clair (FS.14255), Vert Foncé (FS.24098 – 34088), Beige (FS 33448); Brun (FS.20140), Noir (FS.37038) upper surfaces with blue-grey (FS.16357-16360) undersides. Roundels are carried above the top and below the bottom wings

Left: SPAD VII C.1, A-8874/G, of No 23 Squadron RFC, La Lovie, France, 1917. PC-10 upper surfaces (going down also under fuselage; metal panels and undercarriage in Light Grey; undersides and fin in clear light yellowish dope. White 'G' and triangle on fuselage

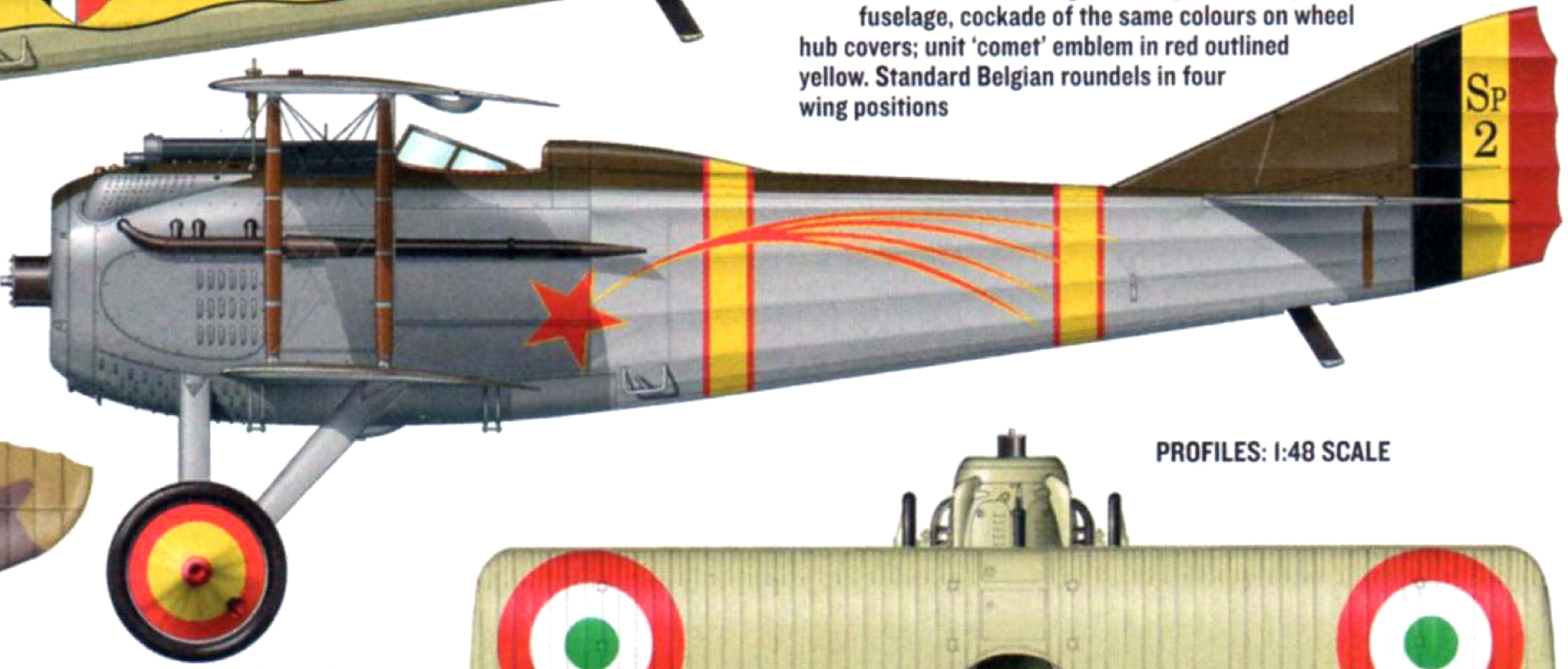
Below: Spad V.II 2489, flown by Italian fighter ace Francesco Baracca, 1918. Light yellowish dope overall with beige front fuselage section including u/c legs. Lower wing undersides painted in green/clear dope/ red (from starboard to port) bands; rampant horse marking on both sides of fuselage; normal roundels on top of wings



Left: SPAD VII, flown by the Commander of XXIII° Gruppo of the Aeronautica del Regio Esercito, Centocelle, late 1923. Aluminium metal front panels, clear yellowish doped canvas areas. Roundels above top wings and below bottom wings. Green/white/red rudder bars extend to most of the horizontal tail surfaces, top and bottom. Insignia combines the emblems of the four Squadriglie of the Gruppo



Below: SPAD VII, SP2 of the 10th Escadrille, Aviation Militaire Belge. Aluminium overall with Khaki top of fuselage and top surfaces of wings and tailplane. Red/yellow/red bands around fuselage, cockade of the same colours on wheel hub covers; unit 'comet' emblem in red outlined yellow. Standard Belgian roundels in four wing positions



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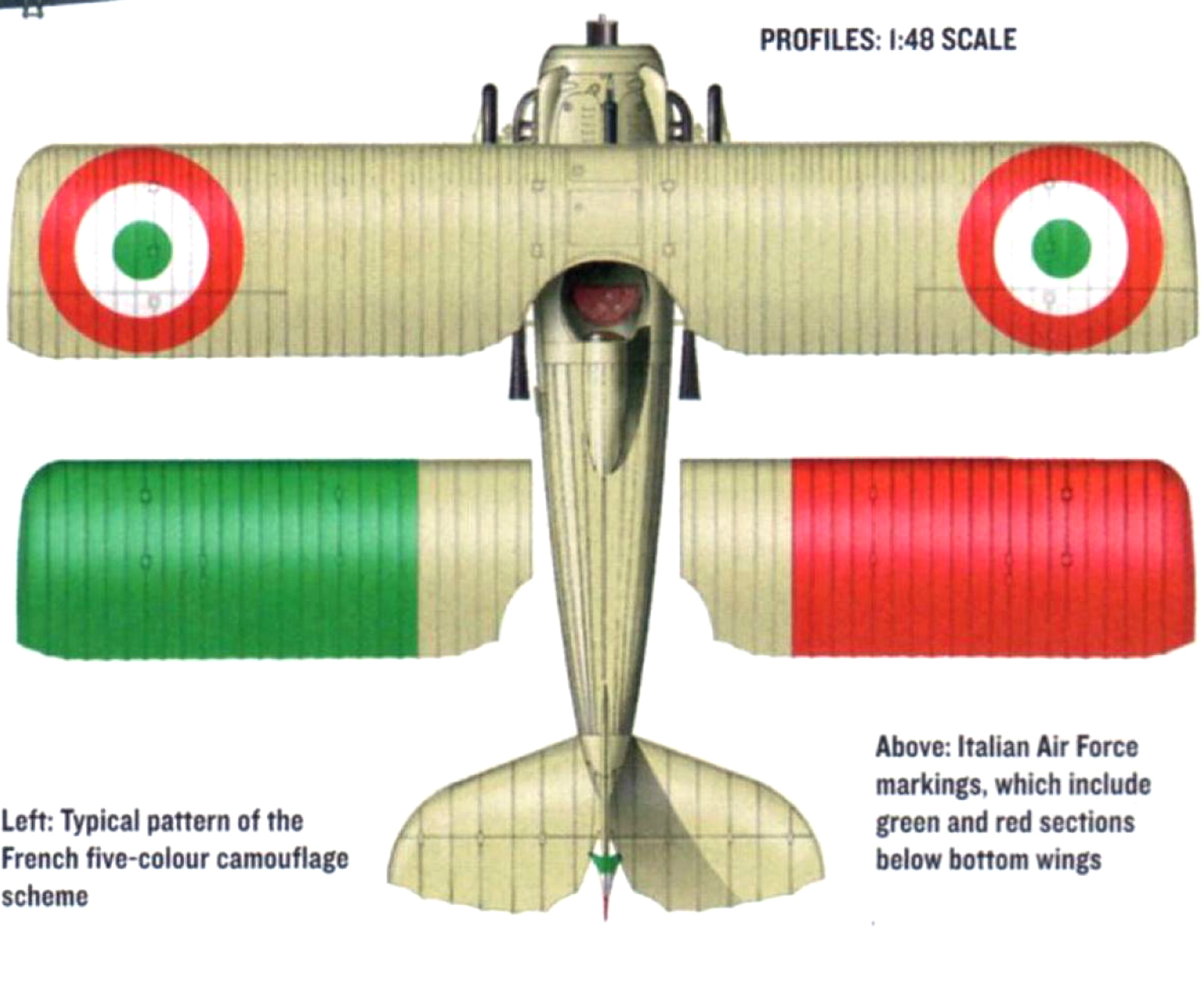
PROFILES: 1:48 SCALE

Left: Typical pattern of the French five-colour camouflage scheme



Above: Italian Air Force markings, which include green and red sections below bottom wings

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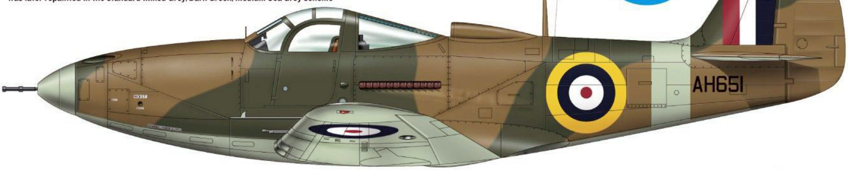
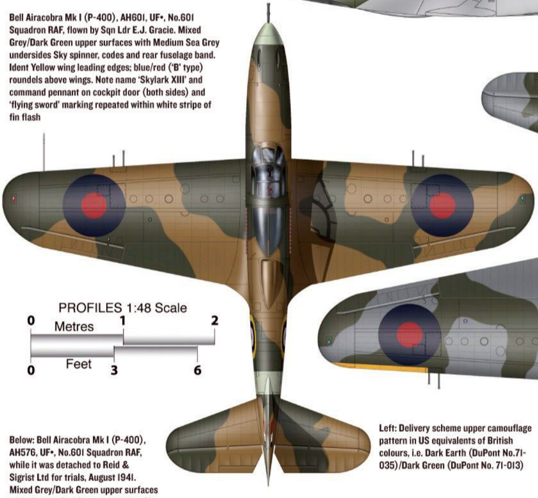
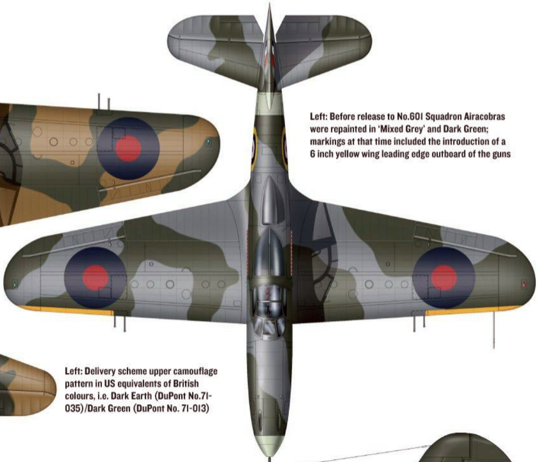
Bell Airacobra Mk I (P-400), AH651, A&AEE Boscombe Down, 1941. Delivery scheme of Dark Earth (DuPont No. 71-035)/Dark Green (DuPont No. 71-013) upper surfaces with Sky (DuPont No. 71-021) undersides Sky spinner and rear fuselage band. Blue/red ('B' type roundels) above wings. Note blue sector of fin flash extended at top up to rudder hinge and early-type 12-stack exhaust. This aircraft was later repainted in the standard Mixed Grey/Dark Green/Medium Sea Grey scheme



Bell Airacobra Mk I (P-400), AH601, UF•, No.601 Squadron RAF, flown by Sqn Ldr E.J. Gracie. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides Sky spinner, codes and rear fuselage band. Ident Yellow wing leading edges; blue/red ('B' type) roundels above wings. Note name 'Skylark XIII' and command pennant on cockpit door (both sides) and 'flying sword' marking repeated within white stripe of fin flash



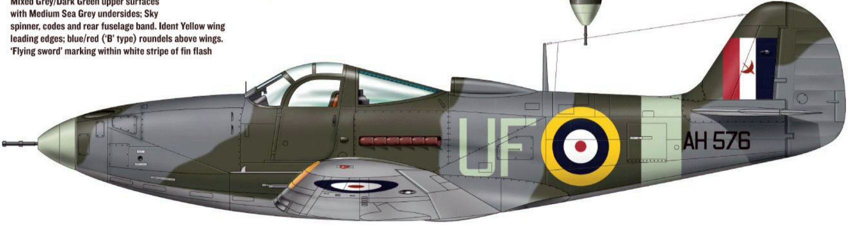


Left: Before release to No.601 Squadron Airacobras were repainted in 'Mixed Grey' and Dark Green; markings at that time included the introduction of a 6 inch yellow wing leading edge outboard of the guns

PROFILES 1:48 Scale
0 Metres 1 2
0 Feet 3 6

Left: Delivery scheme upper camouflage pattern in US equivalents of British colours, i.e. Dark Earth (DuPont No.71-035)/Dark Green (DuPont No. 71-013)

Below: Bell Airacobra Mk I (P-400), AH576, UF•, No.601 Squadron RAF, while it was detached to Reid & Sigrist Ltd for trials, August 1941. Mixed Grey/Dark Green upper surfaces with Medium Sea Grey undersides; Sky spinner, codes and rear fuselage band. Ident Yellow wing leading edges; blue/red ('B' type) roundels above wings. 'Flying sword' marking within white stripe of fin flash



THE FAIREY BARRACUDA

Barracuda P9659 is one from the small batch of 25 Mk Is built, featuring the early exhaust arrangement and short spinner (R.J. Caruana Archives)

Just after 0300 hrs on 3 April 1944, Barracudas from Nos.827 and 830 Naval Air Squadrons (NAS) rumbled down the flight deck of HMS Furious bound for Kaa Fjord, in Northern Norway, where the Tirpitz lay at anchor. That operation was to earn Fairey's sea-borne dive-bomber a brief claim to fame, albeit it was to remain largely unliked for the rest of its career and quickly forgotten afterwards, in many ways, an unsung hero.

The Admiralty's requirement for a new Torpedo-Bomber-Reconnaissance (TBR) monoplane was issued early in May 1937 with the intention of replacing the Albacore. Even though the latter had not yet entered production, it was clearly evident that the biplane era had reached its end. Specification S.24/37 was circulated in October to interested aviation companies while fuller specifications followed on 6 January of the following year. Fairey's design was deemed most suitable from the six submissions received, being rewarded with an order for two prototypes in July 1938. This aircraft featured a shoulder-high monoplane layout, fully retractable undercarriage and was to be powered by a 1,200hp Rolls-Royce Boreas engine (popularly known as the 'Exe').

Design of Fairey Type 100 was entrusted to Marcel J. O. Lobelle, assisted by R.T. Youngman. Theirs no easy task, as S.24/37 featured some nearly-impossible requirements: autopilot, 90° clearance of vision on either side for the observer, fuselage width limited to catapult trolley size and inclusion of all the standard paraphernalia of carrier-born aircraft. Luckily, a request for the installation of a Boulton-Paul four-gun turret was withdrawn at an early stage. Their Lordships felt Fairey's offer was secure enough that an 'off-the-drawing-board' order could be confirmed in August 1939 for 25 examples, without awarding prototype development to any of the other contenders as back-up.

When Rolls-Royce decided against further development of the Boreas, Fairey had to turn to a Merlin replacement for its new design which, by then, had been named Barracuda; originally the Merlin VIII was chosen (later changed to the Merlin 30) resulting in a weight increase and an extensive redesign of the forward fuselage. Moreover, a slowdown on prototype construction was ordered in the summer of 1940 as the Ministry of Aircraft Production tried to concentrate all efforts on existing types. Admiralty pressure ensured a revival of the project, which re-entered Fairey's schedule of work on 19 August, enabling the first prototype (P1767) to perform its first flight on 7 December from Great West Aerodrome, piloted by C.S. Staniland, the company's chief test pilot.

THE BARRACUDA DESCRIBED

Lobelle's design emerged as a cantilever, shoulder-wing monoplane of all-metal stressed-skin construction featuring the notable 'Youngman' flaps which acted as separate aerofoils, providing additional wing area when in the normal position, additional lift at 20° setting for take-off and lift and drag when fully extended during landing. Moreover, these flaps could be set at -30° to act as dive brakes.

P9926, coded 'A' from No.810 NAS, was a Barracuda Mk II built under the first contract of 1939. Note the aerial mast jutting out of the cockpit canopy, offset to starboard, and the ungainly looking radar masts above the wings (Fairey Aviation Ltd)

The Merlin 30 took up most of the forward fuselage up to the cockpit while the unusually designed, inverted 'L' undercarriage retracted partly into the fuselage sides and partly into the wings. A three-man crew was housed under a long glazed canopy that afforded excellent visibility to the pilot. The observer sat just aft, enjoying good sideways and downwards vision through a bulged bow window on either side, though forward vision was practically nil. The radio operator/gunner sat in the far end of the cockpit on a rotating seat and was provided with twin Vickers 'K' guns; to use this defensive weapon the gunner had to raise the rear end of the canopy and slide aft a section of the fuselage top panel.

The rearmost section of the fuselage provided stowage for flares and smoke floats which could be launched via a chute in the floor. An inflatable dinghy was stowed further aft, which the gunner could release via an external lanyard crudely taped to the port fuselage side. An arrestor hook was provided for carrier deck landing and the tailwheel was of the fixed, fully castoring type. Originally, the horizontal tailplane was fitted at the fuselage to rudder junction; this had to be raised due to buffeting as a result of turbulence created by the Youngman flaps.

All fuel was carried in the wings, with one main tank in the inboard fixed section and another in the folding section. Boundary layer fences were fitted, again to counter effects from the flaps when used as dive brakes. An unusual feature was the installation of retractable V-shaped rails under the wings to aid ground handling.

DEVELOPMENT AND PRODUCTION

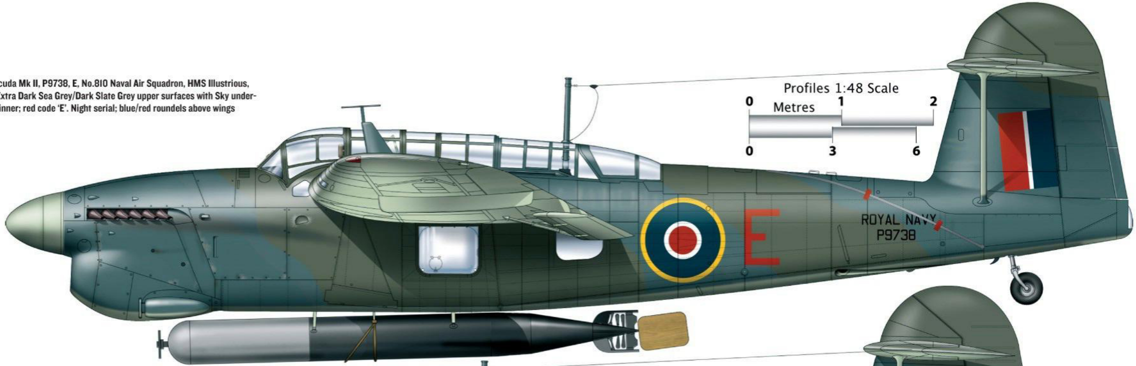
On 18 and 19 May 1941, P1767 performed its deck trials in its original form with No.778 NAS on board the brand-new HMS Victorious while the second prototype's (P1770) first flight was postponed to 29 June due to the tailplane's repositioning as described above. P1767 was similarly modified soon afterwards and in October it went to the Aeroplane & Armament Experimental Establishment at Boscombe Down for handling trials, where it proved to be overweight due to the installation of additional equipment and strengthening of the airframe. While the anticipated maximum speed of 250mph was attained, take-off was extremely slow and it seemed to take ages for the aircraft to climb to a decent altitude.

As a remedy, A Merlin 32 of 1,640hp driving a four-bladed propeller was installed in place of the original Merlin 30 and three-bladed prop installed in P1767, becoming the prototype for the Barracuda Mk II. It flew for the first time on 17 August 1942, displaying improved take-off characteristics, though performance in general remained unchanged.

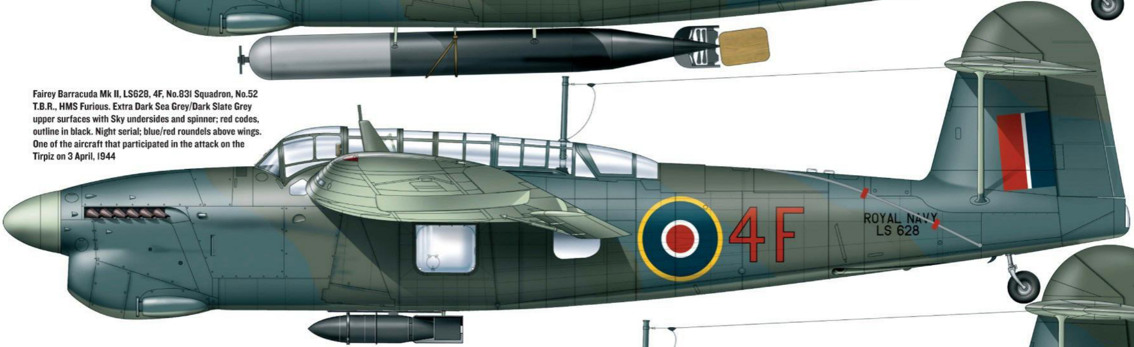
By May, P9642 the first production Mk I, unusually finished in full prototype colours and markings, had flown and was followed by a short run of 29 more examples. Production then switched to 1,688 examples of the Mk II, of which Fairey built 675, Blackburn Aircraft 700, Boulton-Paul 300 and Westland built 13 out of its original allocation of 245.

During late 1942 and early 1943 it appeared as if the Barracuda was

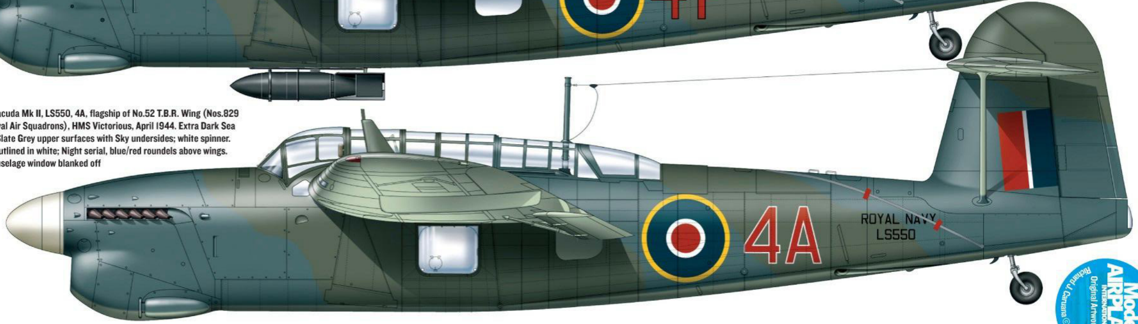
Fairey Barracuda Mk II, P9738, E, No.810 Naval Air Squadron, HMS Illustrious, June 1943. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides and spinner; red code 'E'. Night serial; blue/red roundels above wings



Fairey Barracuda Mk II, LS628, 4F, No.831 Squadron, No.52 T.B.R., HMS Furious. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides and spinner; red codes, outline in black. Night serial; blue/red roundels above wings. One of the aircraft that participated in the attack on the Tirpiz on 3 April, 1944



Fairey Barracuda Mk II, LS550, 4A, flagship of No.52 T.B.R. Wing (Nos.829 and 831 Naval Air Squadrons), HMS Victorious, April 1944. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; white spinner. Red code, outlined in white; Night serial, blue/red roundels above wings. Note rear fuselage window blanked off



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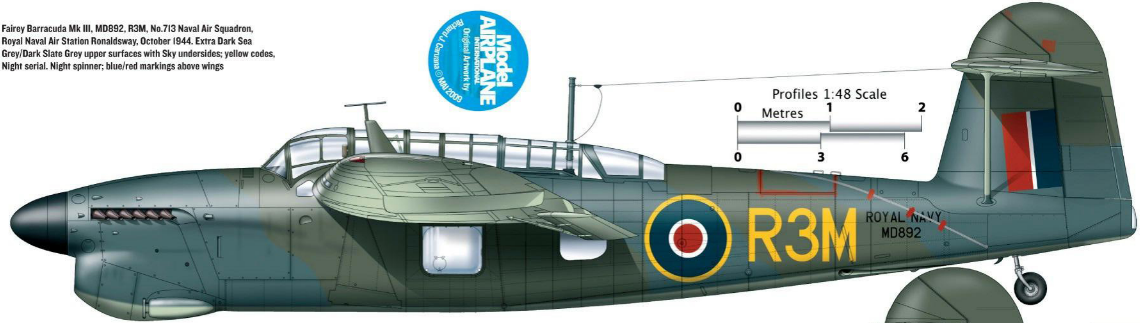
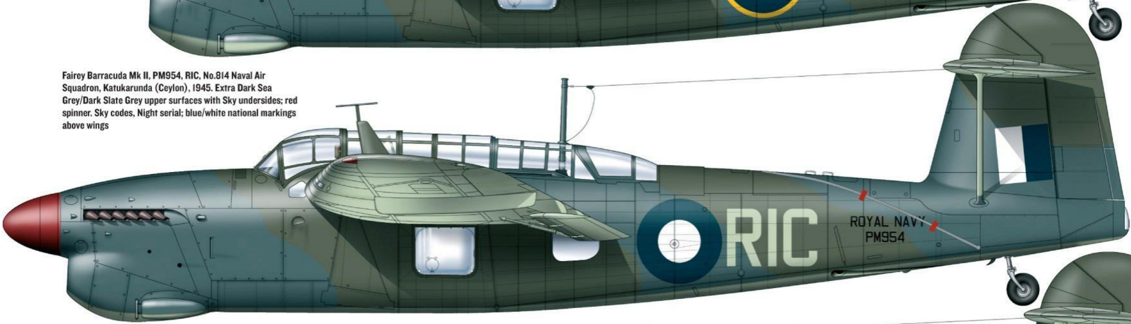
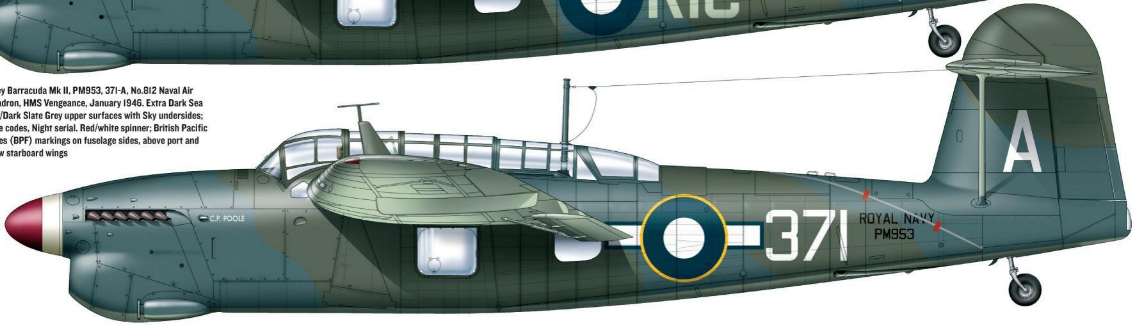
Fairey Barracuda Mk III, MD892, R3M, No.713 Naval Air Squadron, Royal Naval Air Station Ronaldsway, October 1944. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; yellow codes, Night serial. Night spinner; blue/red markings above wings



Fairey Barracuda Mk II, PM954, RIC, No.814 Naval Air Squadron, Katukarunda (Ceylon), 1945. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; red spinner. Sky codes, Night serial; blue/white national markings above wings



Fairey Barracuda Mk II, PM953, 371-A, No.812 Naval Air Squadron, HMS Vengeance, January 1946. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; white codes, Night serial. Red/white spinner; British Pacific Forces (BPF) markings on fuselage sides, above port and below starboard wings



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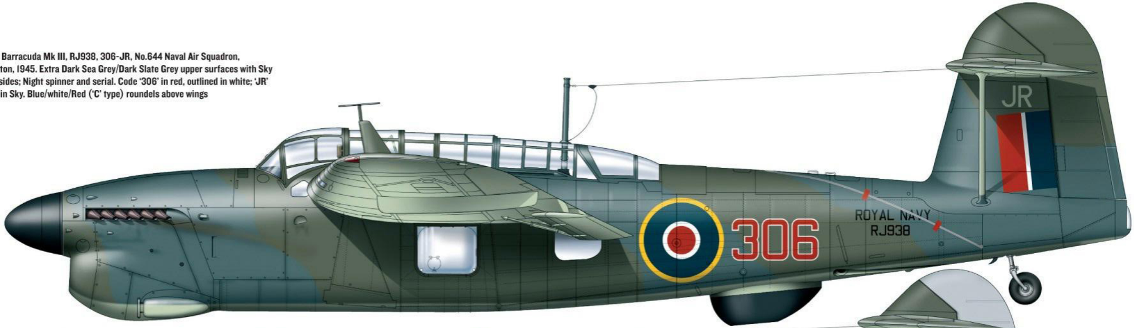
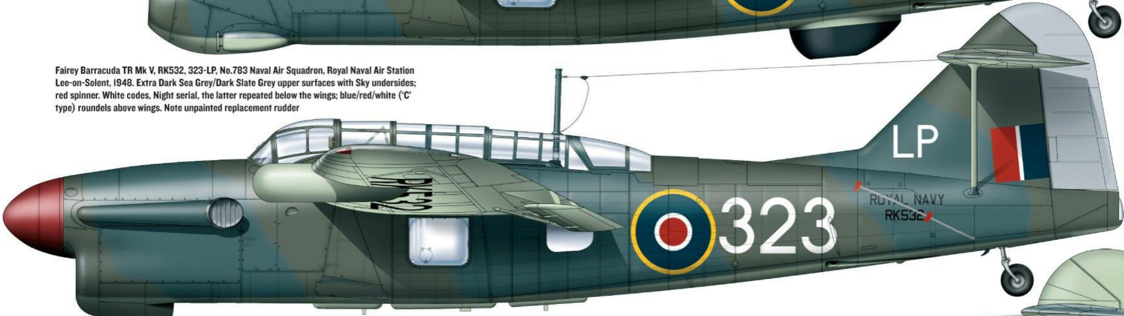
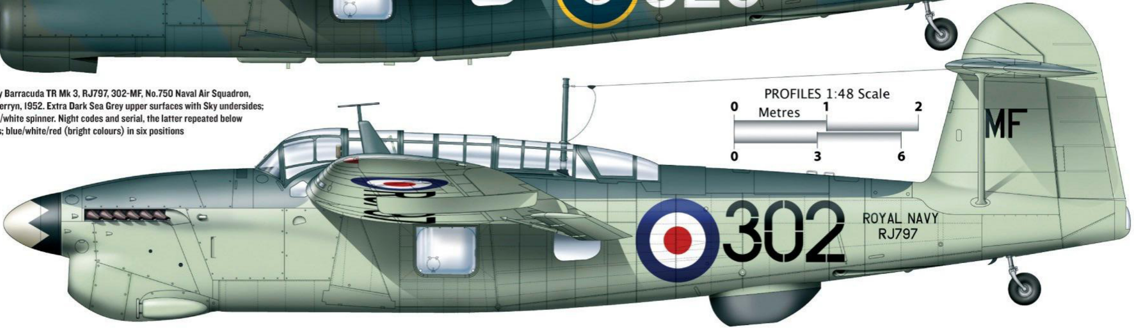
Fairey Barracuda Mk III, RJ938, 306-JR, No.644 Naval Air Squadron, Eglington, 1945. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; Night spinner and serial. Code '306' in red, outlined in white; 'JR' on fin in Sky. Blue/white/Red ('C' type) roundels above wings

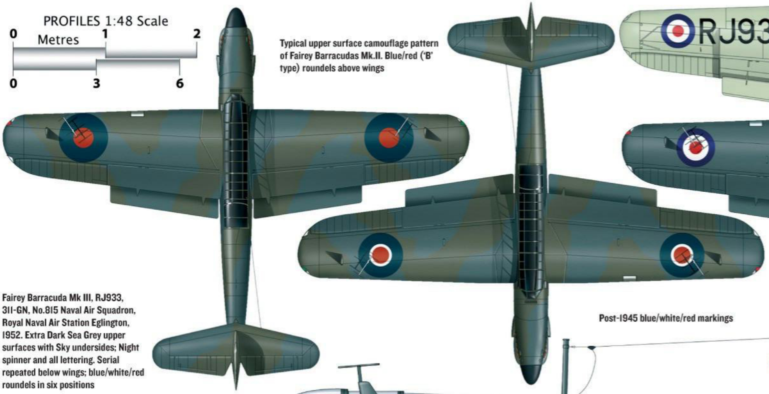


Fairey Barracuda TR Mk V, RK532, 323-LP, No.783 Naval Air Squadron, Royal Naval Air Station Lee-on-Solent, 1948. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; red spinner. White codes, Night serial, the latter repeated below the wings; blue/red/white ('C' type) roundels above wings. Note unpainted replacement rudder

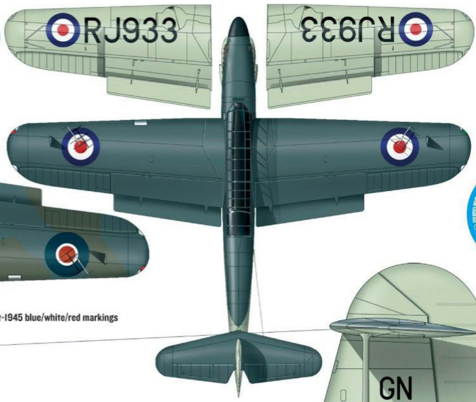


Fairey Barracuda TR Mk 3, RJ797, 302-MF, No.750 Naval Air Squadron, St. Merryn, 1952. Extra Dark Sea Grey upper surfaces with Sky undersides; black/white spinner. Night codes and serial, the latter repeated below wings; blue/white/red (bright colours) in six positions





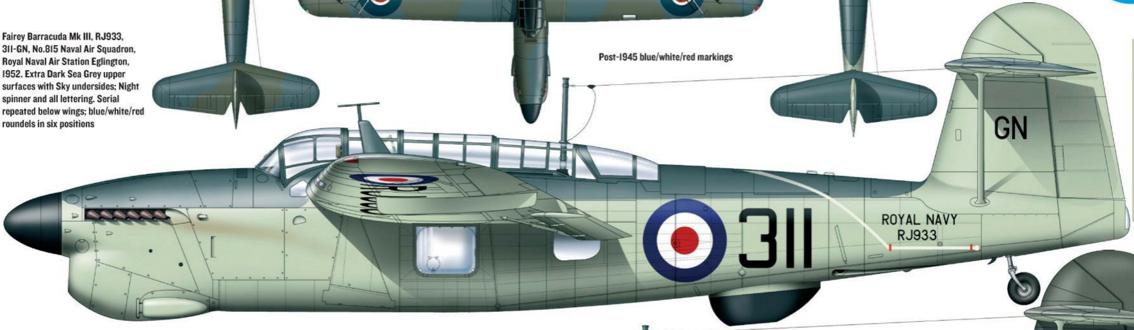
Typical upper surface camouflage pattern of Fairey Barracudas Mk.II. Blue/red ('B' type) roundels above wings



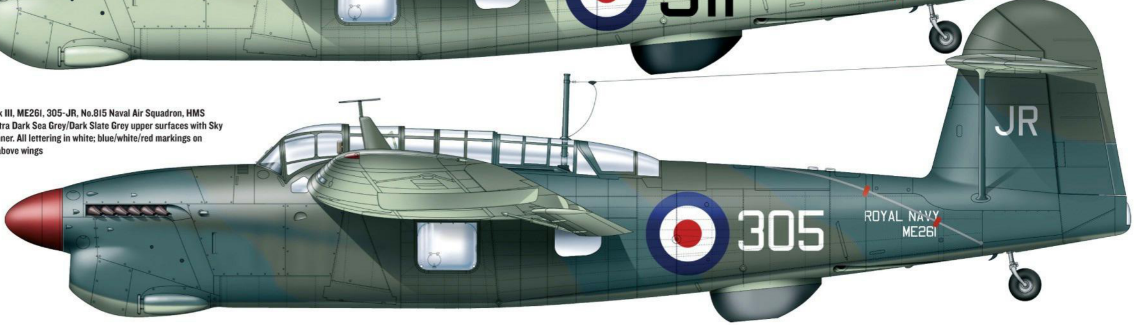
Typical upper finish of Fairey Barracuda upper surfaces post-war, in Extra Dark Sea Grey only with blue/white/red roundels in bright colours; roundels carried also below the wings. Note style and position of serial below wings

Post-1945 blue/white/red markings

Fairey Barracuda Mk III, RJ933, 311-GN, No.815 Naval Air Squadron, Royal Naval Air Station Eglington, 1952. Extra Dark Sea Grey upper surfaces with Sky undersides; Night spinner and all lettering. Serial repeated below wings; blue/white/red roundels in six positions



Fairey Barracuda Mk III, ME261, 305-JR, No.815 Naval Air Squadron, HMS Illustrious, 1958. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; red spinner. All lettering in white; blue/white/red markings on fuselage sides and above wings



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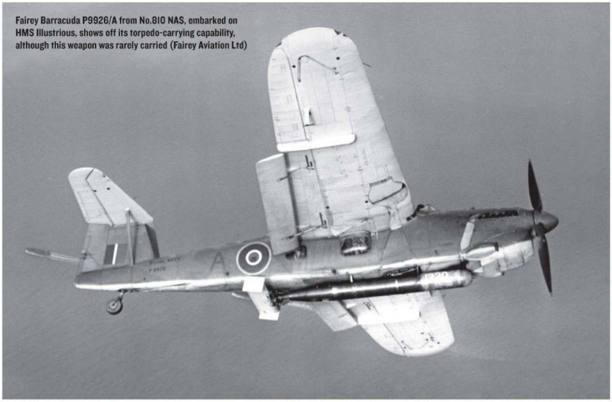
Fairey Barracuda P9926/A from No.810 NAS, embarked on HMS Illustrious, shows off its torpedo-carrying capability, although this weapon was rarely carried (Fairey Aviation Ltd)

doomed to failure, as numerous structural, aerodynamic and engine modifications delayed its entry into service. In fact, a Parliamentary campaign advocated the termination of the programme. Naval aircrew faced a difficult re-training programme, finding the new monoplane quite a handful compared to their previous slow and forgiving Swordfish and Albacore. Other problems surfaced in service use, including structural weaknesses; rivets popped out of the wing surface and wrinkles showed up in the rear fuselage skinning.

INTO SERVICE

Although delivery of the Barracuda had begun in September 1942 at Lee-on-Solent, it was only in January of the following year that No.827 NAS took charge of the new mounts and began to re-equip. Initial conversion was performed on the Fulmar, giving crews some monoplane and Merlin engine experience. However, the work up period was marked by a string of accidents – some even fatal – earning the Barracuda an undeserved notoriety.

The second unit to form on the Barracuda was No.810 at Lee-on-Solent on 4 April 1943 as a matter of urgency, so much so that some of its aircraft were taken from No.827 NAS. On 9 June, No.810 NAS boarded HMS Illustrious for a six-week work-up period in the Clyde and off the Orkneys, sailing into the Mediterranean as part of Force H after a diversionary sweep off the Norwegian coast. It had been planned that aircraft from Illustrious would support the landings at Salerno between 9 and 11 September; however, they remained below deck all the time, while Seafires and Martlets provided top cover to the landing troops.

Other units had meanwhile converted to the type, including No.830 in May 1943, Nos.823, 831 and 847 in June, No.822 in August, Nos.815 and 829 in October, Nos.817 and 826 in December, and No.820 in January 1944. These 12 units were paired into six TBR Wings, and more squadrons began to fly Barracudas during 1944: Nos.841, 828, 812, 814, and 837, while No.821 took on charge the new Barracuda Mk III. The 'new' version incorporated the installation of the American Mk X radar in a fairing below the rear fuselage thus replacing the Air Surface Vessel (ASV) Mk II whose aerials were mounted externally on masts above each wing. DP855 was converted to become the Mk III prototype, and was followed by 460 examples built by Fairey and 392 by Boulton-Paul.

INTO ACTION

Eight years in gestation and the Barracuda still had to prove its worth! The first real major success was against the German battleship Tirpitz, at anchor in Kaa Fjord, Norway. Nine strikes were performed against the enemy ship between April and August 1944, and except for the last operation all were led by Lt Cdr Roy 'Daddy' Baker-Falkner DSC, RN, Wing Leader No.8 TBR Barracuda Wing. The first strike, 'Operation Tungsten', saw the involvement of Nos.829 and 831 NAS from HMS Victorious in conjunction with Nos.827 and 830 NAS from HMS Furious, escorted by Seafires, Corsairs, Hellcats and Wildcats. Method of attack was by dive-bombing, and several of the Barracudas' bombs found their target, so much so that the ship was left burning fiercely in two areas from which a column of smoke rose for hundreds of feet into the air. It was however the attack of 29 August by Barracudas from HMS Formidable and HMS Furious, using 1,600lb bombs that crippled the ship beyond repair leaving the Lancasters of Nos.9 and 32 Squadrons (RAF) to finish her off using 12,000lb 'Tallboys' on 12 November; and then she only capsized, refusing to go down to a watery grave. 176 Barracuda sorties had been flown against Tirpitz, only two aircraft being lost in action, one of which was that of Baker-Falkner on 18 July 1944.

Barracudas were also active fighting the U-boat menace and against enemy shipping in general, with no less than 14 vessels sunk and 17 damaged. Meanwhile HMS Illustrious with No.21 TBR (Nos.810 and 847 NAS) on board was operating in the Far East, flying sorties against port installations in Sumatra and the Andmans Islands between April and June 1944. The following month, Victorious and Indomitable augmented the Eastern Fleet's power carrying Nos.831, 815 and 817 Squadrons flying Barracudas; their operations started in August. On the 24th of that month, 32 Barracudas bombed rail and harbour installations at Indaroeng and Emmahaven, while on 18 September their attention their target was Sigli. On 19 October the Barracudas from Indomitable flew their last with strikes against Japanese posts in the Nicobar Islands as the type was being replaced by Grumman Avengers. However, Barracudas were to reappear briefly the following year, in the very final bouts of the Pacific War, with one squadron each on Glory, Colossus, Venerable and Vengeance. Fireflies replaced Barracudas by the end of 1945, although No.827 Squadron retained its Mk IIs on Colossus till July 1946.

POST WAR DEVELOPMENT AND SERVICE

After the end of hostilities the RN still had Nos 812, 814, 826, 827 and 860 NAS flying Barracudas, all of which gradually converted to the Firefly while the only post-war unit to reform on the old type was No.815 at Eglington, using a dozen ex-744 NAS Mk IIIs.

A rebuilt Mk II formed the basis for the Mk V, intended as a stop-gap measure until the Spearfish could enter service. In the event, both aircraft failed to make it, although the new Griffon-engined Barracuda did mark a certain advance on its predecessors. Apart from being powered by a Griffon VII or VIII, it had redesigned wings of slightly longer span with square-cut tips. The higher torque of the engine was countered by a further increase in fin area. First production Barracuda Mk V flew on 22 November 1945 and was followed by a further 29 examples out of the projected 140 on order. Maximum speed increased from 240mph of the Mk III to 270mph. However, the Fleet Air Arm found no frontline use for the aircraft and the few examples were distributed among training units, including Nos.744, 750 and 753 NAS.

Few realise that at 2,572 examples built, the Barracuda holds the record for the number of any one type supplied to the British Navy. Its inherent strength must have saved the day many a time, yet it never really shook off its back the initial bad name attributed to it due to a number of unfortunate accidents. It was generally unloved by the crews who flew it though most admit that it performed well if handled properly and could take great punishment.

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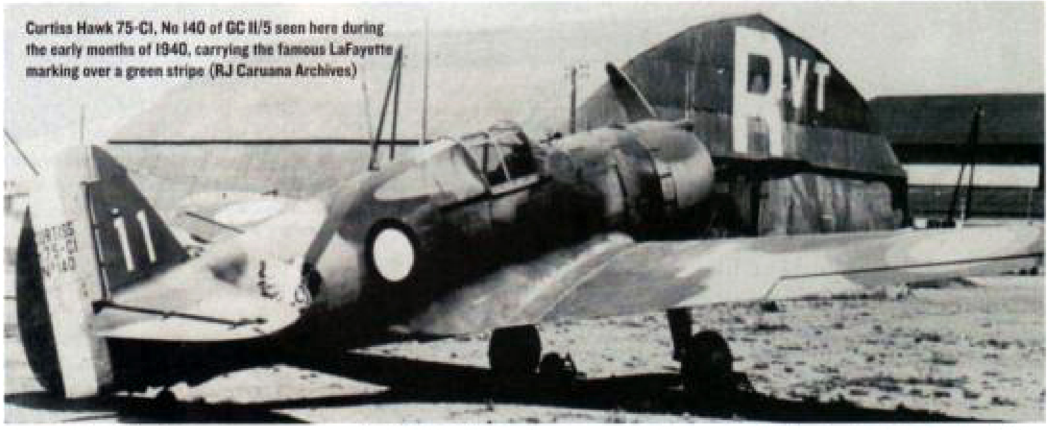
MD837 is a Barracuda Mk III built by Boulton-Paul at Wolverhampton, and can be distinguished by the ventral radome. Note also the external dinghy release lanyard attached to the rear fuselage (Westland Aircraft Ltd)

FIRST OF THE HAWKS

Just before World War Two, a fighter aircraft full of new ideas appeared on the aviation scene: the Curtiss P-36/75 Hawk, of all-metal construction, featuring a retractable undercarriage and an enclosed cockpit, signs pointing towards the latest technology. Above all, it afforded flexibility at a time when the word was practically unheard of in the aviation industry. To those European nations that had turned a blind eye towards German re-armament during the second half of the 'thirties, the Hawk promised to be the providential answer and the fact that it did not deliver was not completely its fault.


Curtiss Hawk 75-CI, No 140 of GC II/5 seen here during the early months of 1940, carrying the famous LaFayette marking over a green stripe (RJ Caruana Archives)

By the early 1930s even the United States Army Air Corps (USAAC) had to face the reality pointing towards the swansong of biplane military aircraft. No amount of improvements – such as retractable wheels and enclosed cockpits – could save contemporary designs from being surpassed by the sleek monoplane. Boeing's P-26, affectionately known as 'Peashooter', was only a first step in the new direction, though its fixed, spatted undercarriage and wire-rigged wings displayed a slow, cautious approach to modernity. However, it provided the USAAC with a certain amount of monoplane experience flying and towards 1935 a design competition was launched for America's first real new-generation fighter aircraft.

The contenders included Curtiss with is Model 75, Chance Vought with the V-141, Consolidated with a modified PB-2A and Seversky. It was Curtiss that, however, produced the most innovative design, with features inexistent in any other fighter aircraft that the USAAC had ever seen. Powered by an equally new Wright 900hp radial engine, the aircraft presented an all-metal structure with fabric covering being limited to the moveable control surfaces. It was also provided with metal hydraulically operated split flaps and the outer wing sections were sealed in such a way so as to provide temporary floatation in case of a forced landing at sea. Of particular interest was the undercarriage mechanism where the main wheel legs rotated through 90° as they retracted rearward so that the wheels lied flush inside the wells. This design, oddly enough, was not CurtissÐ own but belonged to Boeing who cashed in on royalties for its use.

Armament was to the USAAC's contemporary standard, consisting of one .30 calibre gun and a .50 calibre gun mounted on top of the forward fuselage and firing through the airscrew disc. The Curtiss Model 75 was ready for testing by May 1935 but its main competitor, the Seversky P-35 had to wait until August. Both aircraft were found to suffer from a series of faults and during the period granted by the Air Corps to bring the aircraft up to scratch, the opportunity was taken to re-engine both models. Curtiss opted for the 850hp, nine-cylinder Wright Cyclone, which Seversky had discarded from its fighter for the fourteen-cylinder twin-row Pratt & Whitney R-1830 Twin-Wasp. The winner of the contest was the latter variant produced by Seversky, while the second was the earlier Wright version, also by Seversky; the Curtiss 75B chalked up a poor third place while the other competitors were dropped out. The Hawk team was severely disappointed, but not completely beaten.

STATESIDE HAWKS

Seversky's unproven manufacturing capability was a cause for major concern to the Air Corps, which placed an order for three machines powered by the Twin-Wasp under the designation YIP-36 with Curtiss – belts and braces was the policy of the time. Engineers at Wright Field sought the expert advice of pilots of the Ist Pursuit Group who flew the three little fighters through an intensive test programme. This wise move led to an initial order of 210 examples of the Hawk under the designation of P-36A (serialled 38-1 to 38-210) at $ 20,000 apiece (less engine), the first in a line that spawned the famous P-40 of WW II fame. At the time of the Japanese attack on Pearl Harbour of 7 December 1941, the P-36 was in the phase of being replaced by the P-40 but its was the former which shot down the first Japanese aircraft in action for the USAAC.

P-36A serialled 38-20 was taken off the production line and fitted with a 1,110hp R-1830-25 in November 1938; redesignated P-36B it could boast of an improved performance. However, the next production variant was to be the P-36C ,which had an extra pair of .30 calibre guns fitted in the wings. Ammunition for these guns was carried in underwing gondolas. The increased fire-power was also fitted to the last 30 machines of the P-36A production line, these being also fitted with a 1,200hp R-1830-17 engine. These machines were delivered mainly to the 27th Pursuit Squadron, which painted its aircraft in a variety of experimental camouflage finishes for the 1939 'War Games'. Several other experimental versions of the P-36 appeared, including the XP-36D (38-174), modified to carry the wing armament internally, the XP-36E (38-147) armed with four .30 calibre guns in each wing and the XP-36F (38-172) fitted with a 23mm Madsen cannon under each wing.

Not all was well with the P-36 Hawk; despite continuous changes to the design on the production line and even on the field the aircraft was to suffer a series of problems which often led to its being grounded. This slowed the rate of delivery to such an extent that while units of the USAAC, such as the 20th Pursuit Group at Barksdale (LA), retired their old P-26s on schedule it took months for replacements to arrive, with periods when only six serviceable aircraft could be mustered throughout the whole Group! The same happened to the Ist Pursuit Group and when the aircraft arrived they were tied up with so many limitations that it made the P-36 practically useless as a fighter aircraft.

All these problems cost Curtiss much trouble, providing field technicians in a bid to solve problems as they cropped. With time the aircraft settled down but up to the middle of 1939, some 47 out of the 61 P-36s based in the US were grounded for one reason or another. There is no doubt, however, that Curtiss learned at its own expense and incorporated improvements that were eventually embodied into the P-40.

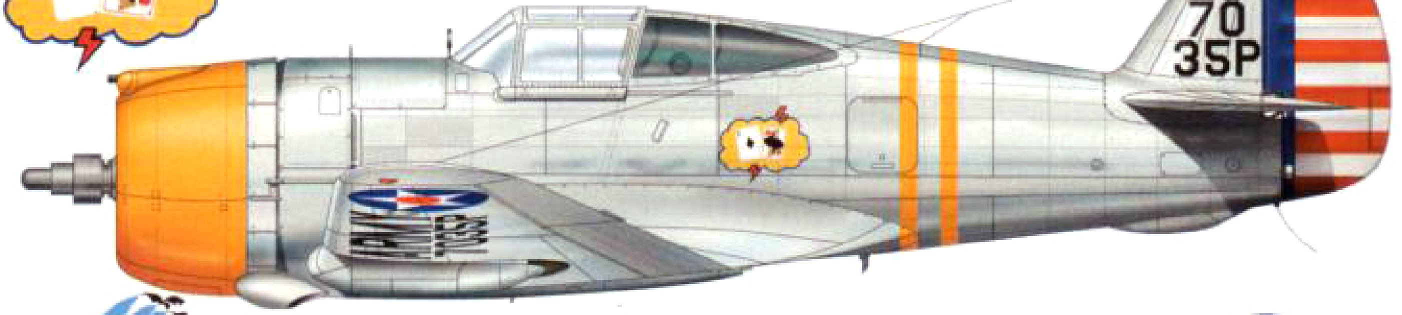
IN FOREIGN FIELDS

What the Hawk did not deliver on home ground was more than made up for its export success. This was in no small measure due to the excellent marketing techniques and foreign contacts Curtiss had acquired through the years. Its brochure provided the Hawk as fighter, fighter-bomber and even trainer. There were two main versions available for export. The first was practically identical to the P-36A and called the Hawk 75A and the other was a stripped-down version with fixed undercarriage simply known as the Hawk 75.

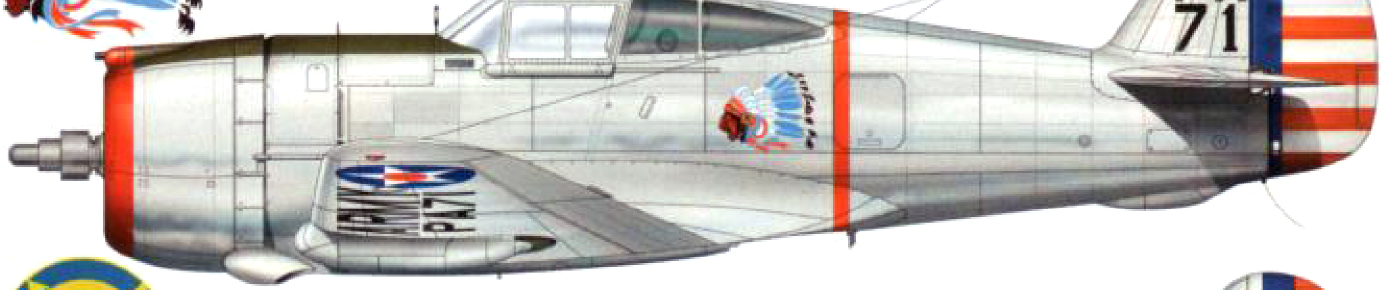
France was to place the first export order in May of 1938 for 100 examples under the official designation of H75A-1, although this was to be changed in Armée de LÐAir service (French Air Force) to H75-CI, the ÐCÐ standing for Chasse, or pursuit aircraft, and the ÐIÐ for single-

Hawk P-36A, PA-81, from the Ist Pursuit Group showing the contemporary style of underwing markings of USAAC aircraft (RJ Caruana Archives)

Curtiss P-36A, 70-35P, Squadron Commander's aircraft, 35th Pursuit Squadron, USAAC. Natural metal overall with Chrome Yellow engine cowling and bands around fuselage; national markings in four wing positions. 'US' and 'ARMY' in black below starboard and port wings respectively; '70-35P' on fin, repeated above and below port wing inboard of national marking. Unit badge on fuselage sides



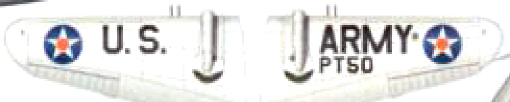
Curtiss P-36A, PA-71, 'A' Flight Leader, 94th Pursuit Squadron, 1st Pursuit Group, USAAC, 1938. Natural metal overall with red bands around front of cowling and rear fuselage, and Olive Drab anti-dazzle panel; national markings in four wing positions. 'U.S.' and 'ARMY' in black below starboard and port wings respectively; 'PA-71' on fin and above and below port wing, inboard of national marking. Unit badge on fuselage sides

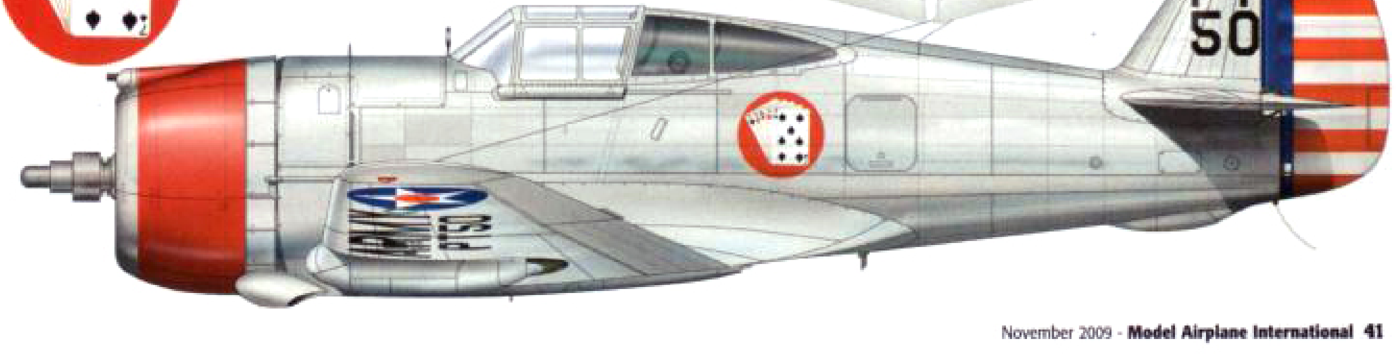


Curtiss P-36A, PT-96, 55th Pursuit Squadron, 20th Pursuit Group (A Flight Leader's aircraft), USAAC, 1940. Natural metal overall with national markings in four wing positions; blue cowling and fuselage band. 'U.S.' and 'ARMY' in black below starboard and port wings respectively; 'PT-96' on fin, repeated above and below port wing, inboard of national markings. Unit badge on fuselage sides

Curtiss P-36A, PT-24, 79th Pursuit Squadron, 20th Pursuit Group, USAAC, 1939. Natural metal overall with national markings in four wing positions and Olive Drab anti-dazzle panel; yellow cowling. 'U.S.' and 'ARMY' in black below starboard and port wing respectively; 'PT-21' in black on fin, above and below port wing. Unit badge on fuselage sides

Curtiss P-36A, PT-50, 77th Pursuit Squadron, 20th Pursuit Group, USAAC. Standard finish; note style of underwing markings at right

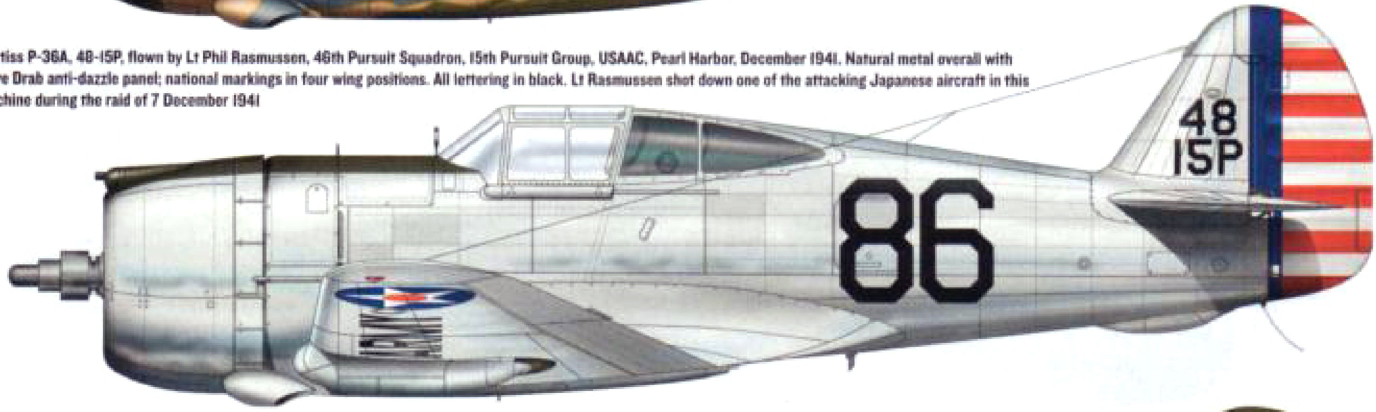




Curtiss P-36C, 69, 27th Pursuit Squadron, Selfridge Field, USAAC, 1939. Experimental wargames camouflage consisting of white, sand and Olive Green; no national markings carried. '69' on fin in black; unit badge on fuselage sides. Note the underwing ammunition box for the 0.30in. calibre wing guns

Curtiss P-36C, 67, 27th Pursuit Squadron USAAC, 1939.Experimental wargames camouflage consisting of White, Sand, Neutral Grey, Dark Blue and Dark Green; no national markings. Black '67' on fin, outlined in white; unit marking on fuselage sides. Note the underwing gondolas for the 0.30in. calibre wing guns

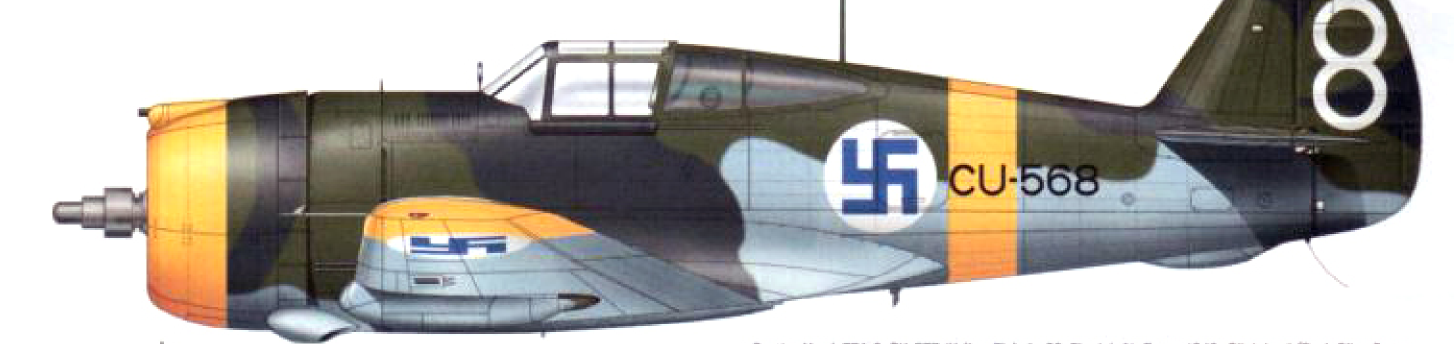
Curtiss P-36A, 48-15P, flown by Lt Phil Rasmussen, 46th Pursuit Squadron, 15th Pursuit Group, USAAC, Pearl Harbor, December 1941. Natural metal overall with Olive Drab anti-dazzle panel; national markings in four wing positions. All lettering in black. Lt Rasmussen shot down one of the attacking Japanese aircraft in this machine during the raid of 7 December 1941



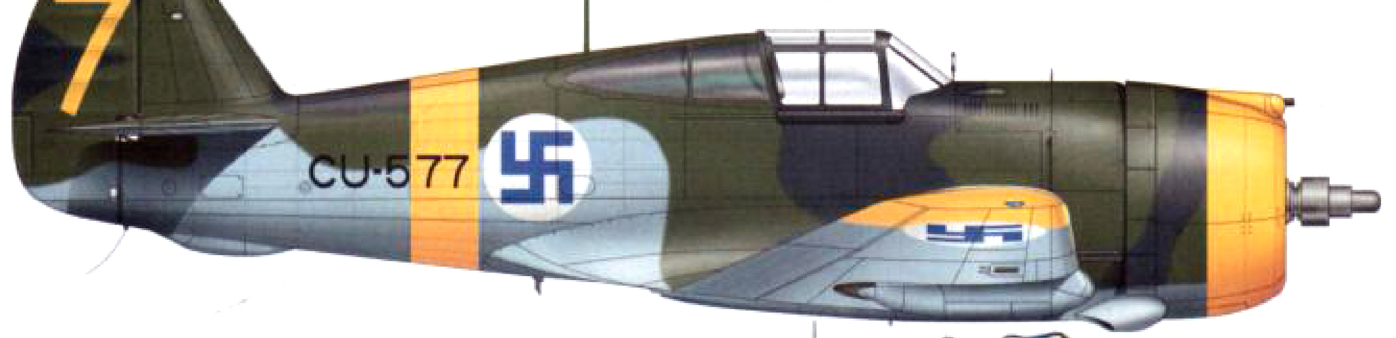
Curtiss P-36C, 2-15P, flown by 1st Lt Harry Brown, 47th Pursuit Squadron, 15th Pursuit Group, Hawaii, December 1941. Olive Drab (ANA 613) upper surfaces with Neutral Grey (ANA 603) undersides; national markings in six positions. 'U.S.' and 'ARMY' in black below starboard and port wings respectively; '2-15P' in black on fin. Brown shot down two attacking Japanese aircraft over Ohau during the attack on Pearl Harbor of 7 December 1941

Curtiss Hawk 75A-6, CU-560, 'Yellow 0', I/LeLv.32, Finnish Air Force, September 1941. *Oliivinkreä* (Dark Olive Green F.S.37038) upper surfaces with *Vali Sininen* (Light Blue F.S.35414); yellow front of cowling, fuselage band and underside of wingtips. Black underside of starboard wing between yellow of wingtip and undercarriage well fairing; yellow '0' on rudder. National markings in six positions

Curtiss Hawk 75A-6, CU-568, 'White 8', LeLv.32, Finnish Air Force, 1943. *Olivinkreä* (Dark Olive Green F.S.37038) and *Musta* (Black F.S. 37038) upper surfaces with *Vall Sininen* (Light Blue F.S.35414); yellow front of cowling, fuselage band and underside of wingtips. National markings in six positions; white '8' on rudder, black serial

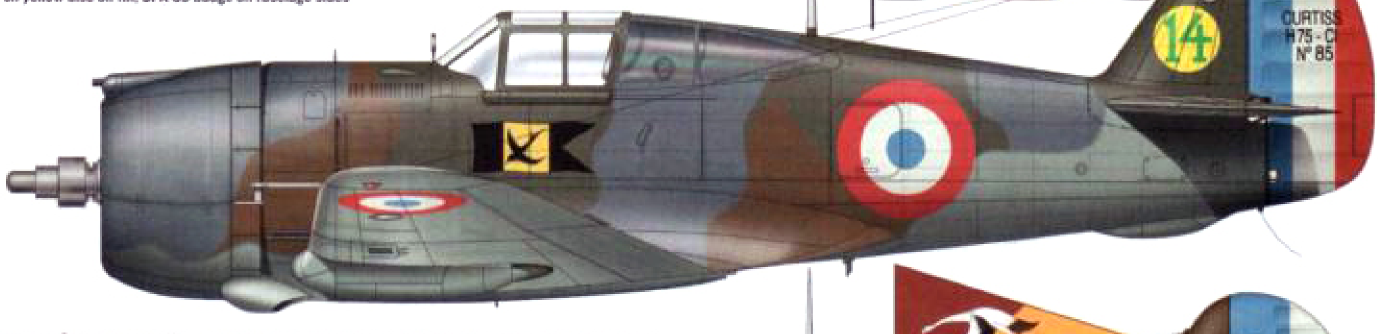


Curtiss Hawk 75A-3, CU-577, 'Yellow 7', LeLv.32, Finnish Air Force, 1943. *Olivinkreä* (Dark Olive Green F.S.37038) and *Musta* (Black F.S. 37038) upper surfaces with *Vall Sininen* (Light Blue F.S.35414); yellow front of cowling, fuselage band and underside of wingtips. National markings in six positions; yellow '7' on rudder, black serial



Curtiss Hawk 75C-1 (75A-2), No. 55, White 3, GCII/5 'Lafayette', Armeè de l'Air, Toul, 1939. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; national markings in four wing positions. Green diagonal stripe on fuselage sides with 'Lafayette' emblem superimposed; white '3', outline in black, on fin

Curtiss Hawk 75C-1 (75A-1), No 85, GC I/4, le Escadrille (SPA 95) Armeè de l'Air, May, 1940. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; national markings in six positions. Green '14' on yellow disc on fin; SPA 69 badge on fuselage sides

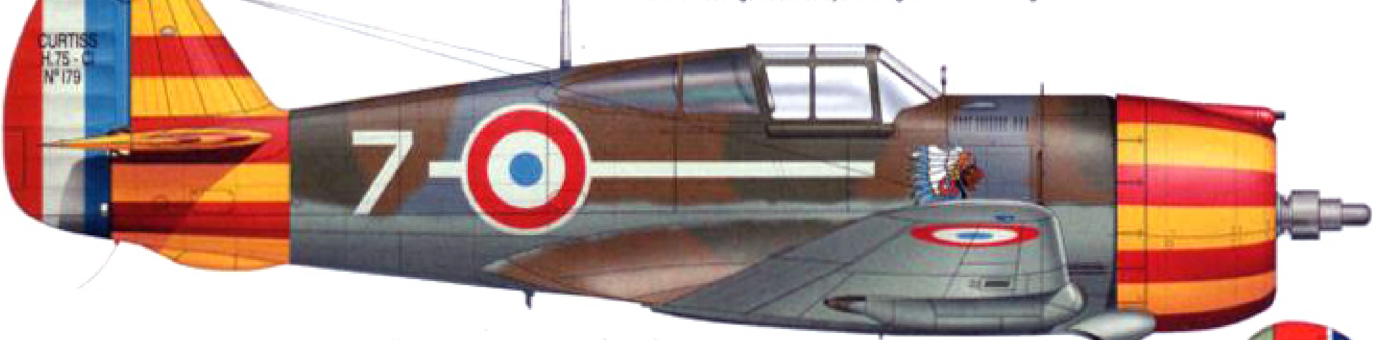


Curtiss Hawk 75C-1 (75A-2), No. 217, GC I/5, Armeè de l'Air. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; national markings in six positions. White '2' on a red disc on fin; 'Champagne' badge on fuselage sides

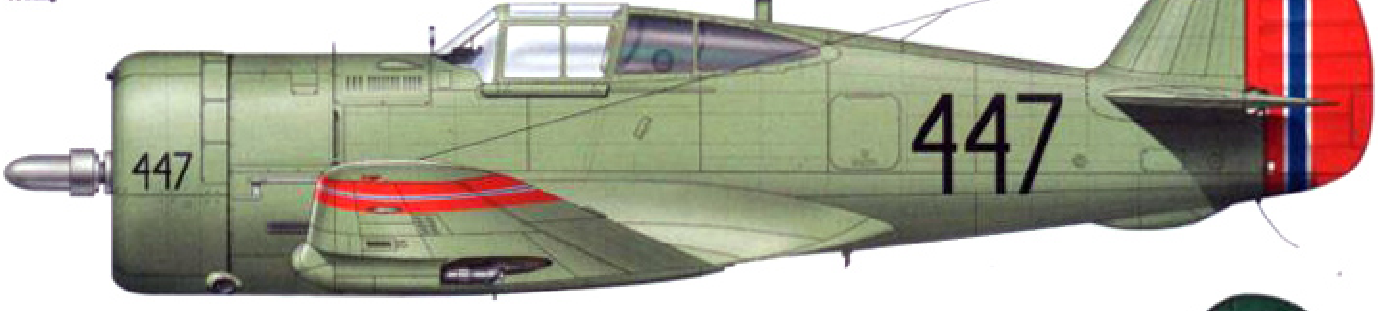
Curtiss Hawk 75C-1, '9', 2e Escadrille, GCI/4, Vichy Air Force, Dakar, West Africa. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; yellow/red striping on cowling, fin and horizontal tail surfaces. National markings in six positions; unit badge on fuselage sides

Curtiss Hawk 75C-1 (75A-2), No.170, White 6, GC II/5 (SPA 167), Vichy Air Force, Mers el Kébir, Algeria, 1941. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; national markings in six positions. White '6' on fin, over a repainted patch; SPA 167 'Cicogne' emblem on rear fuselage sides

Curtiss Hawk 75-C1 (75A-2), No.179, GC II/5, Vichy Air Force, during Operation Torch, 1942. *Vert Foncé/Terre Foncé/Gris Bleu Foncé* upper surfaces and *Gris Bleu Clair* undersides; red/yellow stripes on engine cowling, rear fuselage and horizontal tail surfaces. National markings in six positions, with those on fuselage sides outlined in white, over a white horizontal stripe; white '7' on fuselage sides. 'Lafayette' badge on forward fuselage sides



Curtiss Hawk 75A-8, '447', Norwegian Army Training School, Island Airfield, Toronto (Canada), 1941. Sources indicate that these aircraft were finished in an 'apple green' finish overall with the Norwegian pre-war national markings applied around the wing tips and rudder; serial in black, repeated on engine cowling

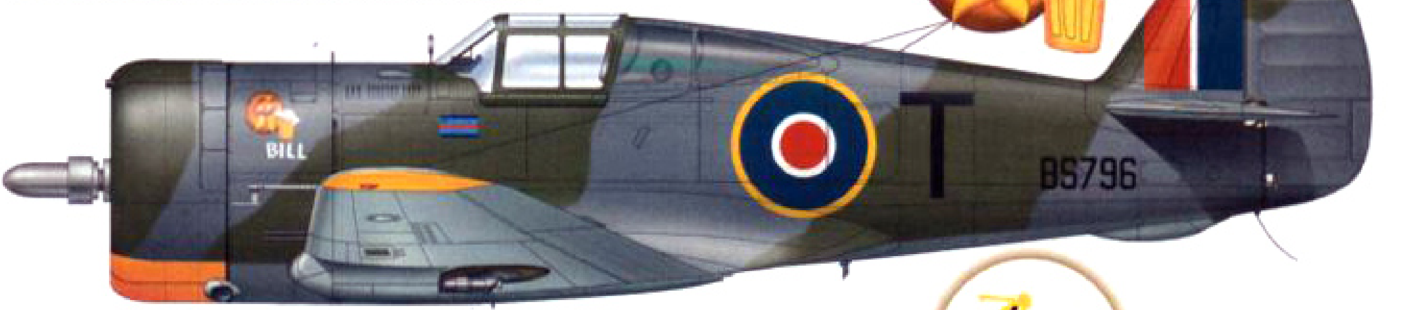


Curtiss Hawk 75A-7, C332, flown by Sgt Hermans, I Jachtafdeling, IV Vliegtuiggroep, Royal Netherlands East Indies Army Air Force, February 1942. *Jongblad* (close to US Medium Green) and *Oudblad* (close to US Olive Drab) upper surfaces with undersides of wings and tailplane left in natural metal; national markings on fuselage sides and below wings. Code in black

Curtiss Mohawk Mk IV, BB975, OQ•X, No.5 Squadron, RAF, Dum-Dum (India), February 1942. Dark Earth/Dark Green upper surfaces with Sky undersides and rear fuselage band; Medium Sea Grey codes, Night serial; red propeller hub. Blue/red ('B' type) roundels above wings; see topside camouflage pattern below left

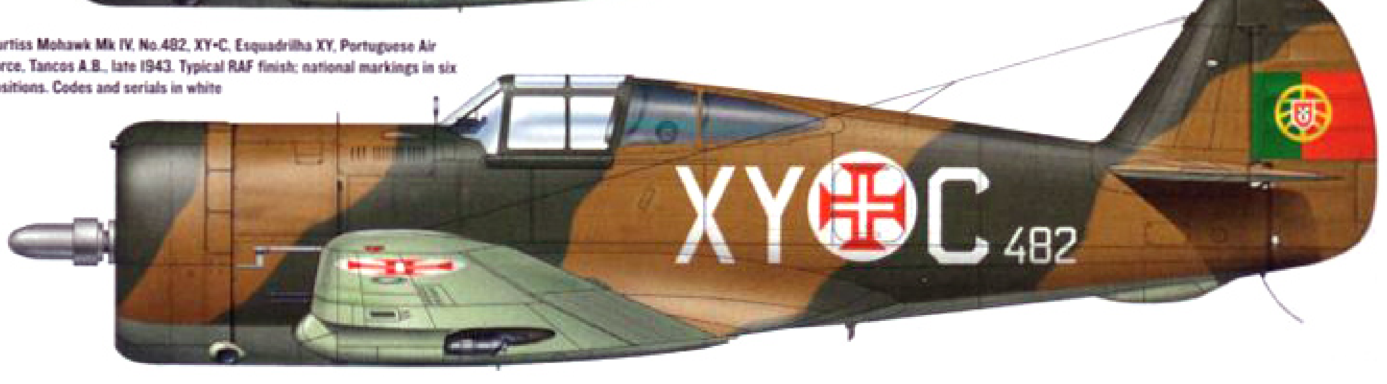
Curtiss Mohawk Mk IV, BS736, •P, No.155 Squadron, RAF, Imphal (India), early 1942. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; yellow undersides of wingtips and engine cowlings, and wing leading edges. Sky rear fuselage band; white code. Night serial. National markings in blue/white, those on the fuselage outlined in yellow; black propeller hub

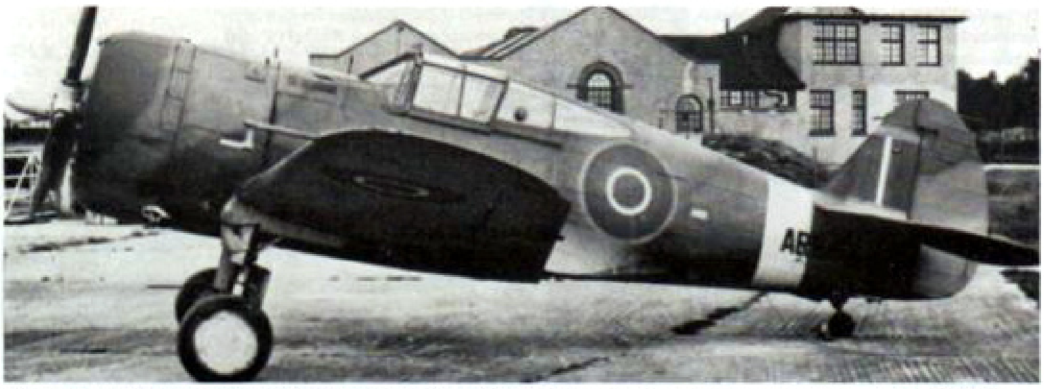
Curtiss Mohawk Mk IV, flown by Sqn Ldr P. Bond, BS796, •T, RAF, Dinjan (India), summer 1942. Ocean Grey/Dark Green upper surfaces with Medium Sea Grey undersides; yellow wingtip and cowling undersides. Codes and serial in Night; blue/red ('B' type) roundels above wings. 'Bill' personal badge on forward fuselage; rank pennant below windscreen



Curtiss Mohawk Mk IV, 2537, No.3 Squadron, South African Air Forcce, Alomata, late 1941. Dark Earth/Dark Green upper surfaces with Sky undersides; national markings similar to RAF, except for orange in place of Ident Red. 'Semper Pugnans' badge on forward fuselage

Curtiss Mohawk Mk IV, No.482, XY•C, Esquadrilha XY, Portuguese Air Force, Tancos A.B., late 1943. Typical RAF finish; national markings in six positions. Codes and serials in white





The UK version of the Hawk, Mohawk IV, AR645 repainted in full RAF markings, including the Sky band on the rear fuselage. Colours are Dark Green and Ocean Grey with Medium Sea Grey for the undersides (RJ Caruana Archives)

seat aircraft. The French machines were powered by the 1,050hp Pratt & Whitney R-1830-SC-3G Twin-Wasp and had two 7.5mm FN-Browning machine guns fitted into the wings in addition to the fuselage mounted pair. First deliveries arrived in France toward the end of that year where they were reassembled at Bourges. At this point they were also fitted with metric instruments to suit French requirements, and further modifications included the reversal action of the engine throttle lever.

By early 1939, the French Government doubled its order, this time for a new version to be known as H75-A2 fitted with an additional pair of wing guns and the installation of the R-1830-S1 C3G engine. So much faith was put in this machine that a further order for 135 examples, designated H75-A3, soon followed, these to be powered by the improved 1,200hp R-1830-3S C3G. Initial favourable comments about the American machines in French use soon turned sour as actual field experience brought out the Hawk's latent defects: wing skin buckling, light armament, complicated fuel system, lack of self-sealing tanks and guns freezing at altitude. Notwithstanding these deficiencies France ordered more of the same: 395 H75-A4s powered by the Wright Cyclone R-1820 G205A engine of 1,200hp.

However, of the total 730 aircraft on order, France only managed to take delivery of 291 before surrendering in 1940, the balance being requested by the Royal Air Force (RAF) in its panic-buying spree ahead of the Battle of Britain. If combat reports are to be taken at face value, then the Hawk acquitted itself well in battle considering its malaise, for it was credited with 230 victories and 80 probables. 23 examples still awaiting delivery in the US were shipped to the West Indies for use by the Free French Air Force.

ENTER THE WRIGHT CYCLONE

As hinted above, the H75-A4 ordered by France was to be re-engined with the more powerful, though not as reliable, Wright GR-1820-G205A, but only a handful of these had arrived in that country, before it had been overrun by German forces. The first A3s and A4s that were switched over to Britain began to arrive in England in July of 1940. As with normal RAF practice, the aircraft was re-named as the 'Mohawk', with the A3 and A4 becoming Marks III and IV respectively; surviving French Hawks A1 and A2 flown to England were redesignated Mohawk Mk.I and Mk.II.

The Mohawk Mk.IV was practically identical to the type ordered by France except for a change in equipment fit to bring it to RAF standards, including the replacement of the machine guns with .303 calibre Brownings. By the time of their arrival in England, the supply situation of both Hurricane and Spitfire had reached a satisfactory level; the Mohawk was found to be comparatively inferior and was retained exclusively by reserve units. Operational service of the Mohawk in the Far East began with No. 5 Squadron RAF on 17 June 1942 from Dinjan in Burma. These Mohawks came from No. 146 Squadron which had received them in March but never used operationally until handed over to the new owners. These were, in fact, Hawk H75-A9s originally destined for the Iranian Air Force. No. 5 Squadron's duties included bomber escort and close support and even managed to draw blood in combat on 20 August. The squadron passed onto 'rhubarbs' in January of 1943 and continued to give a valid contribution up to June when the Mohawk was replaced by the Hurricane.

It was the American fighter, however, which survived longer with Nº 155 Squadron, formed on the Mohawk on 1 April 1942 at Peshawar. It was not until September that the first operational sorties commenced, these including convoy patrols and the aerial defence of Madras. On 10 November, No. 155 Mohawks engaged a deadly battle with Japanese Zeros while escorting Blenheims, and lost two of their number whilst claiming one-and-a-half of the enemy!

The following January the squadron became very busy with strafing attacks and bomber escorts culminating in the heavy fighting at Imphal of March 1943. By May, No. 155 was using the Mohawk for dive bombing, fitted with 20lb bombs, in support of ground troops and continued to give a valid contribution throughout that year; it seemed that, at last, the Hawk had sprung its talons. No. 155's Mohawks – or what was left of them – were replaced by Spitfires Mk.VIII early in 1944.

HAWKS IN STRANGE LANDS

What Mohawks the RAF could not use in the Far East were passed on to other air forces after having been held at Maintenance Units throughout the Battle of Britain as a back-up force, especially in case the situation had taken a turn to the worse. While some were passed on to South Africa, about twelve were handed over to Portugal where they had an interesting career, arriving in October 1941 at Ota base (one was lost during flight testing after re-assembly). These were barely enough to form one squadron, under the command of Captain Saramento. During mid-1943, a letter code system, no doubt inspired by RAF practice, was adopted and this unit received the code XY, and all British serials were replaced by numbers (480 to 490). Known as the Esquadrilla XY until officially numbered Esquadrilla de Casa Nr. 3 after its transfer to Rabo de Peixe in the Azores, it remained in active service until 1945.

Several other countries had found the Hawk attractive, including the Chinese Government, which also obtained a manufacturing licence for the GR-1820-G205A Cyclone powered Hawk 75-A5. Armament was changed to six 0.3inch machine guns, making these aircraft practically identical to the British Mohawk. By the time the Loi-Wing factory was razed to the ground in October 1940 by Japanese attacks, very few Hawks had left the assembly line and whatever jigs and parts could be salvaged were passed on to Hindustani Aircraft Factory where production of 48 examples for the Indian Government began. Only one Hawk H75-A5 had been finished and flight-tested (31 July 1941) when the facilities at Bangalore were required for maintenance by the USAAF; production ceased after the delivery of a handful of these fighters.

The H75-A7 denoted the Dutch version of which 20 examples had been ordered (after originally requesting 35 machines). These had the same fuselage armament as the A8 but only one gun per wing. Ironically, these Hawks never touched Dutch soil due to the invasion of May 1940, and were transferred to the Netherlands East Indies. On their arrival the fuselage guns were replaced with 7.7mm guns due to ammunition problems and by the time Japan entered the conflict in December 1941 there were 16 Hawks of this type on strength. Within a couple of months of bitter fighting this force was cut down by half and eventually completely wiped out by Japanese opposition in early February when they tried to put up a spirited, though impossible, defence of Java.

Next in line came the Hawk H75-A8 for the Norwegian Air Force. These 36 examples followed 24 Twin-Wasp H75-A6s that Norway failed to receive due to the German invasion (some A6s found their way to England via France). The H75-A8 was another Cyclone-powered version but had an armament of two fuselage-mounted 12.7mm guns in the fuselage and four 7.9mm guns in the wings. Ordered in January of 1940, these fighters could not be delivered to Norway and were transferred to a special training base in Canada (Island Airport near Toronto) still retaining full Norwegian markings. Eventually half of these were repurchased by the US Government and given to Peru under Lend-Lease agreement in May 1942, designated P-36G. Just a year later the surviving dozen examples in US service were also passed on to Peru in a similar transaction. These were retained by Escuadron de Caza 21 up to 1947, some remaining in front line service well into the 'fifties.

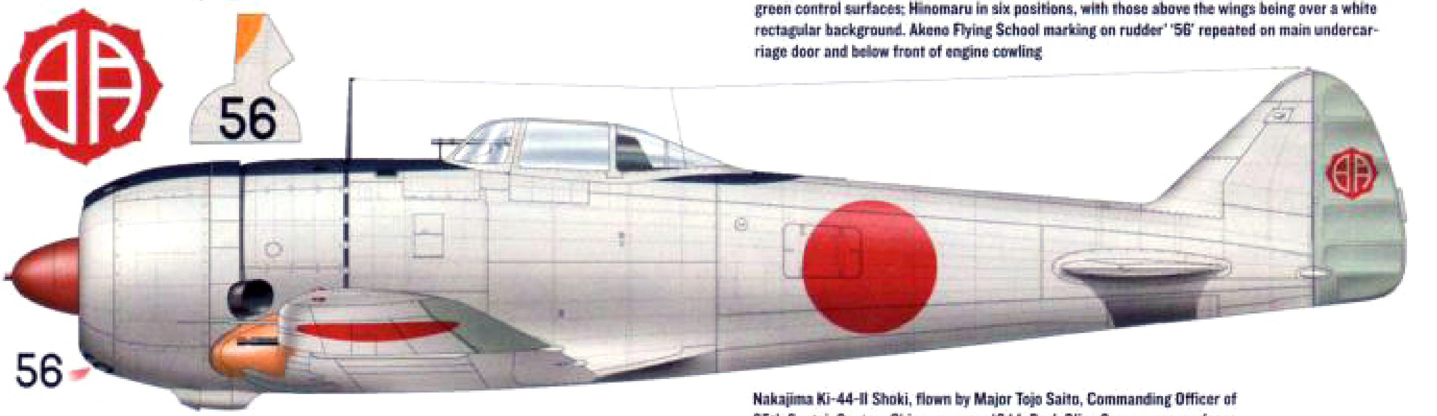
The last customer for the Cyclone Hawk was the Imperial Iranian Air Force. 10 examples were ordered, fitted with six .3in machine guns and delivered in June 1941. When the following August British forces occupied the country they were found still in their crates. These H75-A9s were transported by road to Karachi where they were assembled and issued to No. 5 Squadron as Mohawks Mk.IV.

An unofficial customer was, of course, the Luftwaffe. Though having never ordered the Hawk from America it captured considerable numbers of these aircraft in both France and Norway. After cursory flights and evaluations these aircraft began to find their way to some training units or to be used as squadron hacks. However, 44 examples were overhauled at Espenlaub Flugzeugbau to be sold to Finland. Initially this country acquired 29 examples (twenty-one A3s and eight A4s), nicknamed 'Sussu' in service. Though operating in very tough conditions, these Hawks gave a good account of themselves though attrition was on the high side. So an additional 15 ex-Vichy Air Force A1s and A2s were passed by Germany on to Finland.

Not exactly a brilliant aircraft, the Hawk was providentially available when air forces in Europe needed them most, even though they arrived too late. It served well and fought to keep its head high at all times. The poor operational record cannot be totally blamed on the machine; it had been sought mainly as a stop-gap measure by most customer countries even though it was already clearly outclassed by the time it appeared on the frontline. However it had the unique accolade of having fathered the excellent P-40 series of 'Hawks' that later acquitted itself with great honour wherever it fought during the Second World War. One thing is certain – few aircraft of the period can boast to have donned such colourful schemes. So, as far as the modeller is concerned, the Hawk 75 can be considered as a winner. ■

Nakajima Ki-44 Shoki, '5' (fifth prototype), flown by the commanding officer Sqn Ldr Toshio Sakagawa of 1st Shotai, 47th Dokuritsu Chutai, Saigon (Vietnam), 1942. Middle brown upper surfaces with grey-green undersides; white trim on vertical tail surfaces. White rear fuselage band edged in red; Hinomaru in four wing positions. Unit badge below cockpit; red '5' on mainwheel doors

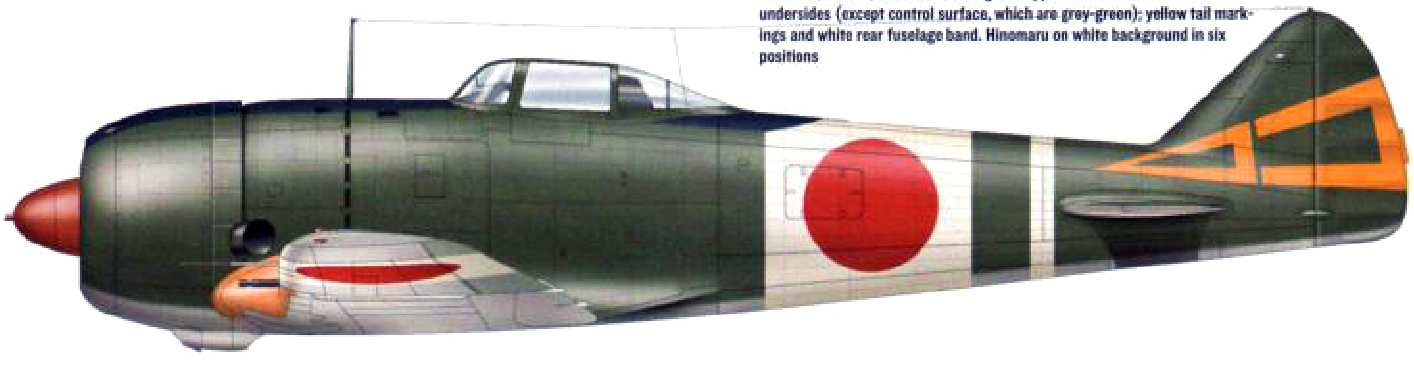
Nakajima Ki-44, '56', Akeno Kikoshidan Hikotai, Akeno, 1944. Natural metal overall with pale grey-green control surfaces; Hinomaru in six positions, with those above the wings being over a white rectagular background. Akeno Flying School marking on rudder' '56' repeated on main undercarriage door and below front of engine cowling

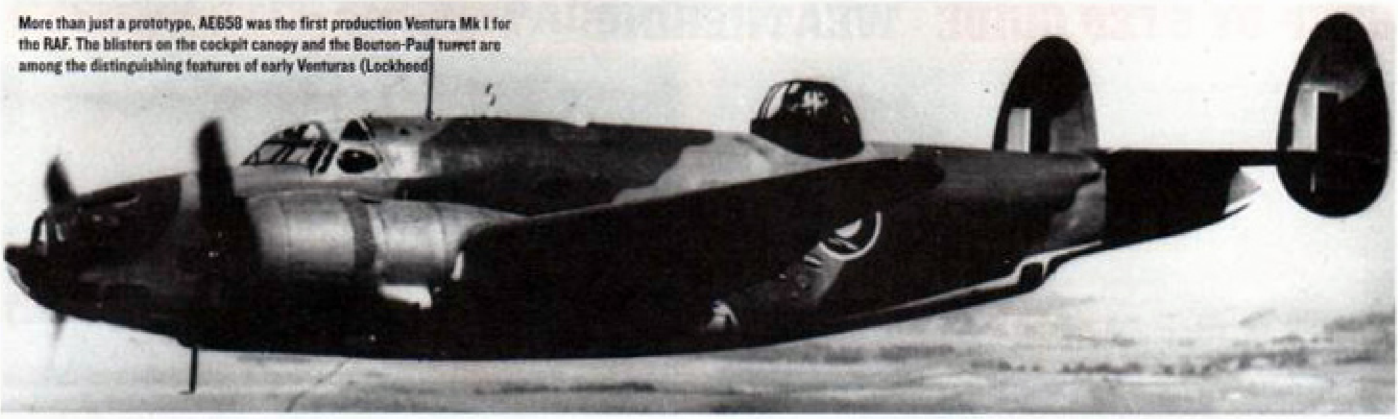


Nakajima Ki-44-II Shoki, flown by Major Tojo Saito, Commanding Officer of 85th Sentai, Canton, China, summer 1944. Dark Olive Green uppersurfaces and Light Grey undersides; bluish-black anti-dazzle panel. Blue spinner and blue/white markings around fuselage and fin/rudder; orange yellow wing leading edges

Nakajima Ki-44-II-Otsu, '36', Shinten Seikuutai, 47th Sentai, Tokyo, summer 1944. Natural metal overall, except for control surfaces that are grey-green; red trim to fuselage and tail. Hinomaru over white background in six positions; badge below cockpit

Nakajima Ki-44 Shoki, 3rd Chutai, 70th Sentai, 10th Hikou Shidan, Kashiwa, Chiba Prefecture, 1944. Dark olive green upper surfaces with natural metal undersides (except control surface, which are grey-green); yellow tail markings and white rear fuselage band. Hinomaru on white background in six positions





More than just a prototype, AE658 was the first production Ventura Mk I for the RAF. The blisters on the cockpit canopy and the Bouton-Paul turret are among the distinguishing features of early Venturas (Lockheed)

NOTHING VENTURED... NOTHING GAINED!

The Lockheed PV-I Ventura

What should have been a successor to the Lockheed Hudson has often, and most generously, been described as a failure. That the PV-I Ventura has no accolades to its credit is basically correct but asking for the stuff of heroes from a workhorse is hardly fair and certainly difficult, though not quite impossible... so read on.

When the British Purchasing Commission was seeking a replacement for the Hudson already in service with Coastal Command, Lockheed launched a project for a completely new aeroplane based on the commercial twin-engined Model 18 Lodestar. In many ways this was similar to the way the Hudson had been derived by the same firm from the smaller Model 14 Super Electra, enabling the type to enter production within a relatively short time due to the use of common jigs and tooling for a larger part of the airframe.

Using the company designation of L-108, Lockeed offered a number of engine configurations, beginning with powerplants in the 1000hp class as used by the Model 18, considered sufficient for a general reconnaissance aeroplane. With more powerful engines in the 1600-2000hp range the aircraft could potentially become a light/medium bomber and offered as a Blenheim replacement. As the Air Ministry was already looking for such a replacement, an order for 25 Model 32-94-01 bombers was placed with Lockheed, with a specification that was to lead to the Model 37-21-01 powered by a pair of 1850hp Pratt & Whitney SIA4-G Double Wasp eighteen-cylinder radial engines, better know by its military designation of GR-2800. The order was now changed to 300 examples in May 1940 (AE658-957) and increased later that same year by a further 375 bombers (AJ163-537) under the designation of Ventura Mk.I and Mk.II respectively.

Production of the new bomber was entrusted to the Vega Airplane Co., situated very close to Lockheed's plant at Burbank in California. By that time Vega had become a Lockheed subsidiary and was eventually absorbed completely into Lockheed at the end of 1941. Externally the Ventura was very similar to its predecessor – the Hudson – except that it was larger and, therefore, heavier. The massive increase in power had been considered adequate to compensate for the additional weight. It was similarly fitted with a Boulton-Paul dorsal turret positioned further towards the nose so as to improve field of fire. Additionally it carried a pair of fixed 0.303in machine guns in the nose, a similar flexible pair in a transparent nose section and another pair of flexible 0.303in guns in a ventral position in the rear fuselage. An internal bomb-bay to accommodate 2,500lb of bombs was also included in the Air Ministry's specifications.

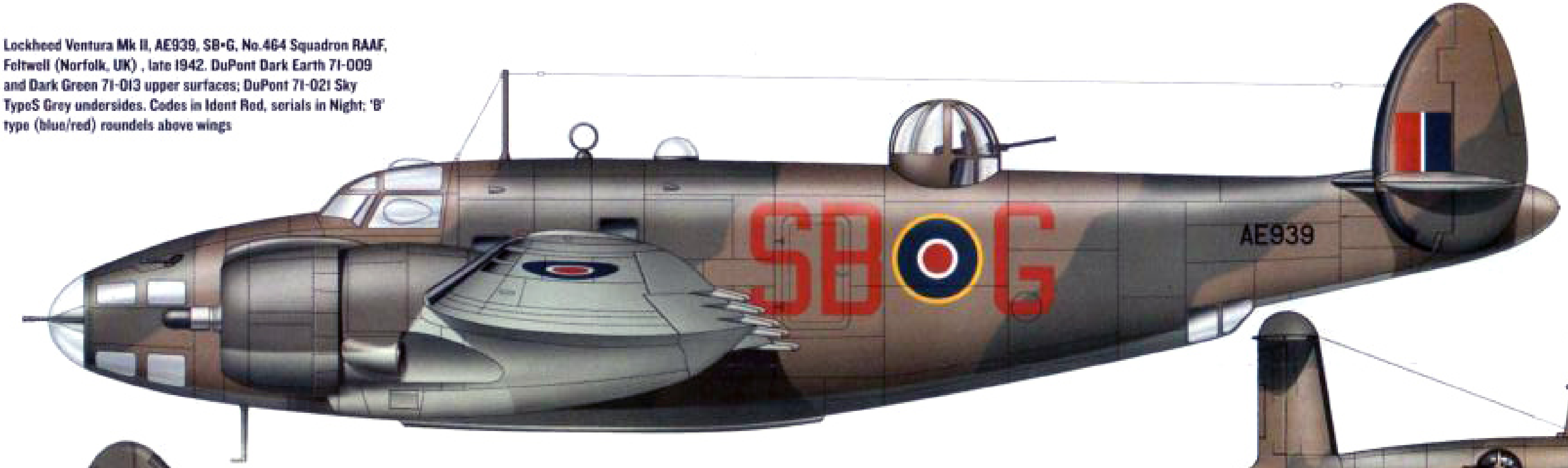
Ventura Mk.I AE658 flew for the first time on 31 July 1941 from Lockheed Air Terminal and deliveries to Britain began in September of that same year. While the Mk.Is were fitted with the 1850hp SIA4-G Double Wasp, the Mk.IIs had a pair of 2000hp Pratt & Whitney R-2800-31s installed. The type was pressed into service use with No. 21 Squadron Royal Air Force (RAF) at Bodney in Norfolk in May 1942. No. 487 Squadron (Royal New Zealand Air Force – RNZAF) was formed at Feltwell, Norfolk, on 15 August 1942 on the Ventura, soon to be joined by No. 464 Squadron (Royal Australian Air Force – RAAF) the following 1 September, within No. 2 Group, Bomber Command.

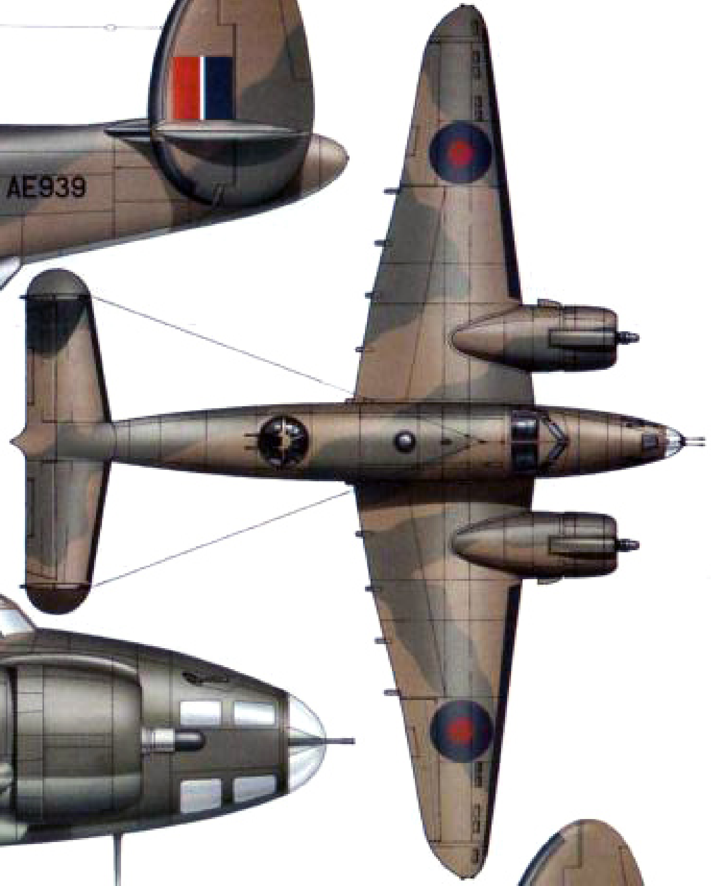
On 3 November 1942 the Ventura went to war when three bombers from No. 21 Squadron were assigned a factory at Hengelo as target, but the raid was diverted against railway lines. A massive outing for all three Ventura squadrons of No. 2 Group took place on 6 December when 47 bombers accompanied by Bostons and Mosquitos participated in a low-level attack against the Philips' establishment at Eindhoven. Conflicting reports of Venturas lost during that mission to the heavy ground defences range from nine to thirteen aircraft; what is certain is that hardly any of the other Venturas made it back to base in without any form of damage.

Tactics were immediately changed after that disastrous raid and the Ventura was deployed in medium altitude operations. Losses continued inevitably, two bombers falling to the guns of fighters defending Brest on 4 April 1943; two weeks later three other bombers were lost during an attack against the Abbeville marshalling yards. Even worse fate awaited No. 487 Squadron on 3 May when only one of eleven Venturas attacking Amsterdam managed to return. During that raid, however, Sqn Ldr Leonard H. Trent shot down a Messerschmitt Bf 109 firing his fixed forward guns, only to be shot down himself soon afterwards; Trent was taken prisoner, survived the war, and later awarded the Victoria Cross for that action.

PV-Is are here seen on the production line at Vega's plant, Burbank, California. Each PV-I left the plant with a cartoon on its rear fuselage; in this case naval personnel can be seen admiring 'Kid Vega' who is 'Reporting for duty, Sir!' (Lockheed)

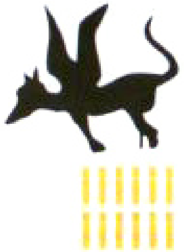
Lockheed Ventura Mk II, AE939, SB•G, No.464 Squadron RAAF, Feltwell (Norfolk, UK) , late 1942. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces; DuPont 71-021 Sky TypeS Grey undersides. Codes in Ident Red, serials in Night; 'B' type (blue/red) roundels above wings





Lockheed Ventura Mk I, AE692, YH•K, No.21 Squadron RAF, Methwold (Norfolk, UK), January 1943. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces; DuPont 71-021 Sky TypeS Grey undersides. Codes in Ident Red, serials in Night; 'B' type (blue/red) roundels above wings

Lockheed Ventura Mk I, AE660, EG•Y, No.487 Squadron RNZAF, Feltwell (Norfolk, UK), 1943. DuPont Dark Earth 71-009 and Dark Green 71-013 upper surfaces; DuPont 71-021 Sky TypeS Grey undersides repainted aft of wing leading edges in Night. Codes in Ident Red, serials in Night; 'B' type (blue/red) roundels above wings. Previous code 'H' overpainted (probably in Dark Green); 'Y' repeated on nose



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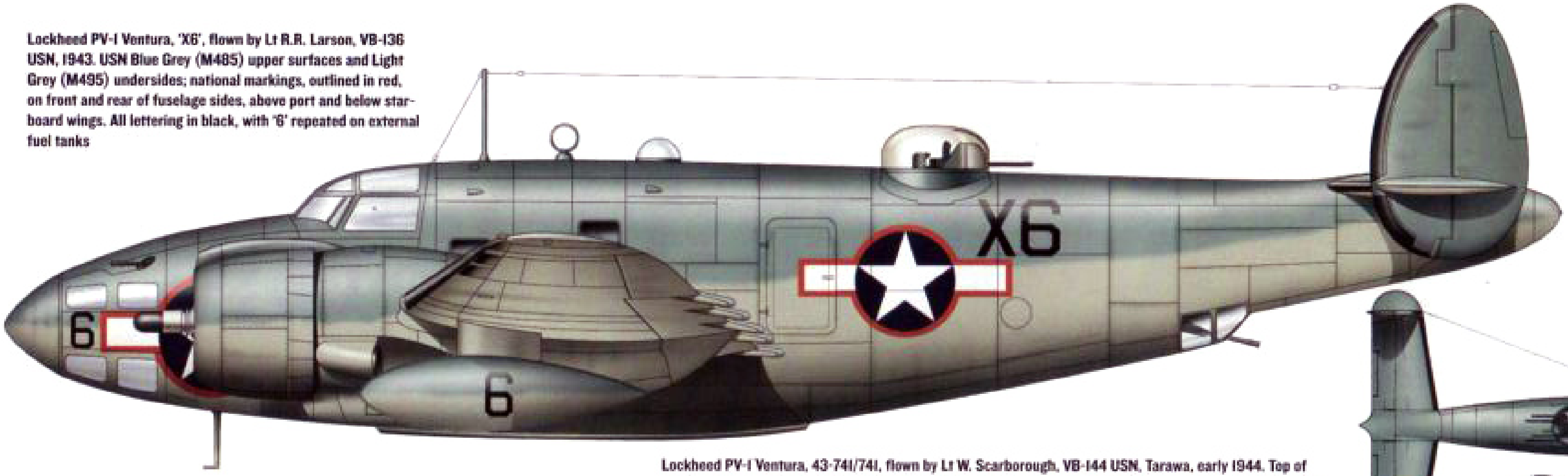
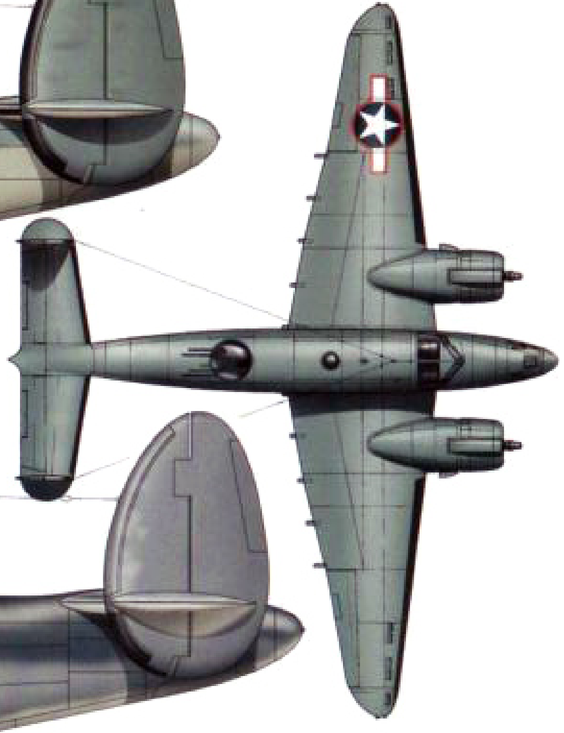
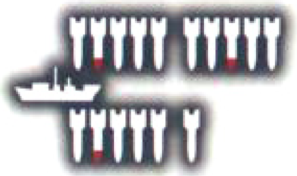
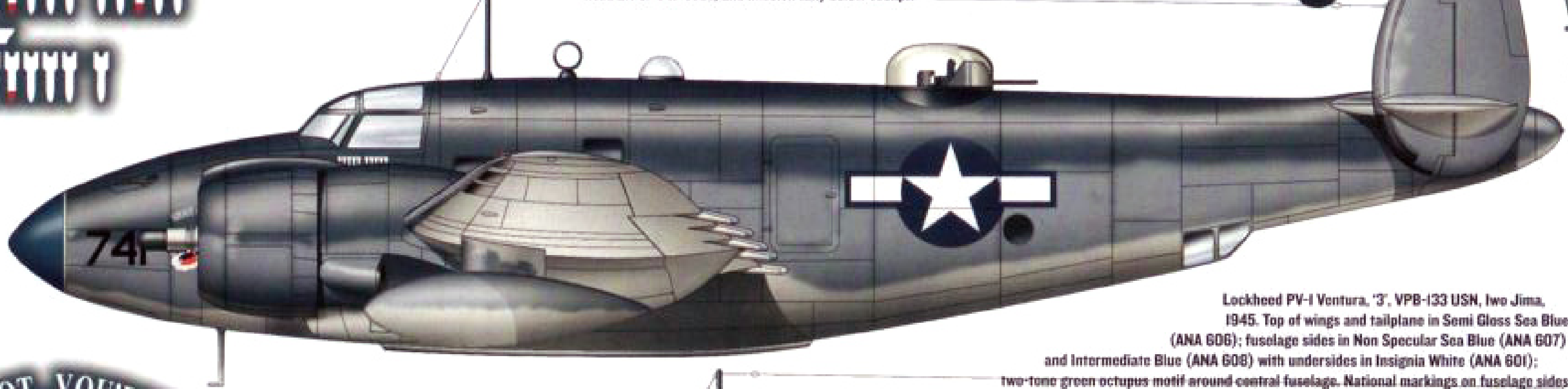
Lockheed PV-1 Ventura, 'X6', flown by Lt R.R. Larson, VB-136 USN, 1943. USN Blue Grey (M485) upper surfaces and Light Grey (M495) undersides; national markings, outlined in red, on front and rear of fuselage sides, above port and below starboard wings. All lettering in black, with '6' repeated on external fuel tanks



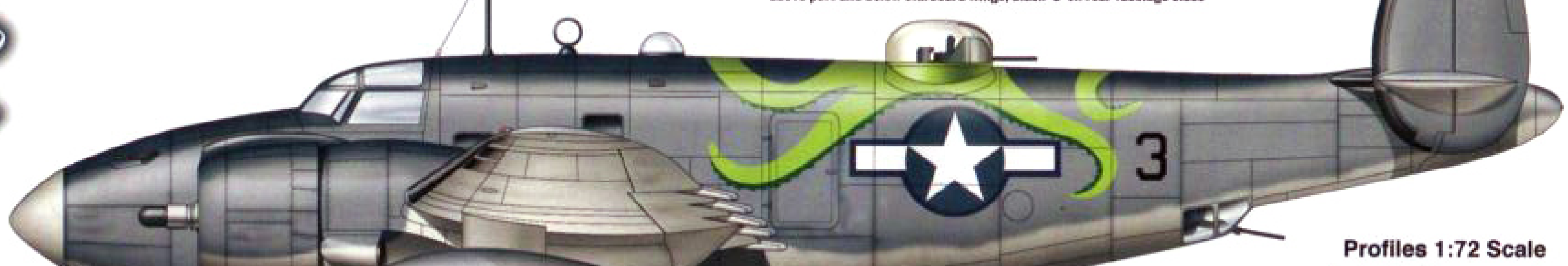


Lockheed PV-1 Ventura, 43-741/741, flown by Lt W. Scarborough, VB-144 USN, Tarawa, early 1944. Top of wings and tailplane in Semi Gloss Sea Blue (ANA 606); fuselage sides in Non Specular Sea Blue (ANA 607) and Intermediate Blue (ANA 608) with undersides in Insignia White (ANA 601); blue/white nose. Lettering inblack; national markings on fuselage sides, above port and below starboard wings. Bugs Bunny cartoon on nose aft of '741' code, and mission tally below cockpit





Lockheed PV-1 Ventura, '3', VPB-133 USN, Iwo Jima, 1945. Top of wings and tailplane in Semi Gloss Sea Blue (ANA 606); fuselage sides in Non Specular Sea Blue (ANA 607) and Intermediate Blue (ANA 608) with undersides in Insignia White (ANA 601); two-tone green octupus motif around central fuselage. National markings on fuselage sides, above port and below starboard wings; black '3' on rear fuselage sides



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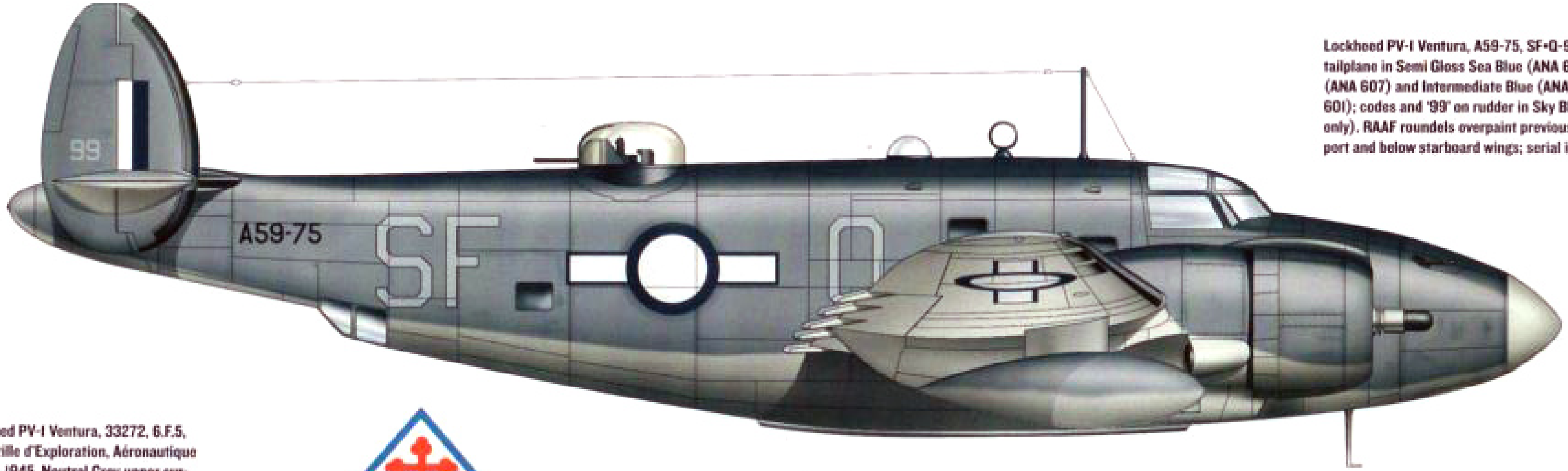
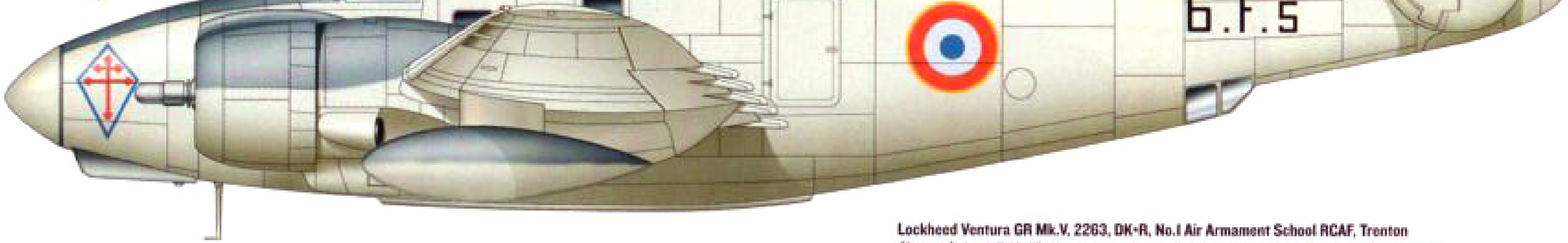
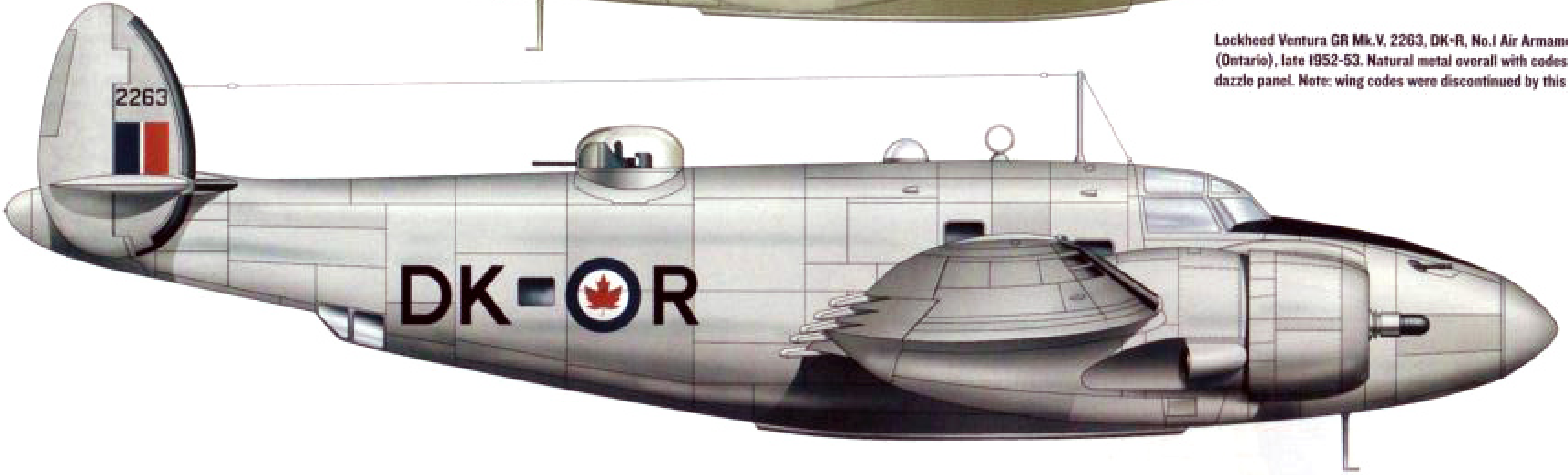


Lockheed PV-1 Ventura, A59-75, SF•Q-99, No.13 Squadron RAAF. Top of wings and tailplane in Semi Gloss Sea Blue (ANA 606); fuselage sides in Non Specular Sea Blue (ANA 607) and Intermediate Blue (ANA 608) with undersides in Insignia White (ANA 601); codes and '99' on rudder in Sky Blue (with SF-Q outlined in black on starboard side only). RAAF roundels overpaint previous US markings, carried on fuselage sides, above port and below starboard wings; serial in night

Lockheed PV-1 Ventura, 33272, 6.F.5, 6e Flottille d'Exploration, Aéronautique Navale, 1945. Neutral Grey upper surfaces with Insignia White undersides; code and serials in black. 'Cross of Lorraine' marking on nose (indicating the Forces Navales Françaises Libres - Free French Naval Forces); roundels on fuselage sides and above wings. Note black anchor on fin flash only



Lockheed Ventura GR Mk.V, 2263, DK•R, No.1 Air Armament School RCAF, Trenton (Ontario), late 1952-53. Natural metal overall with codes and serials in black; Black anti-dazzle panel. Note: wing codes were discontinued by this time.



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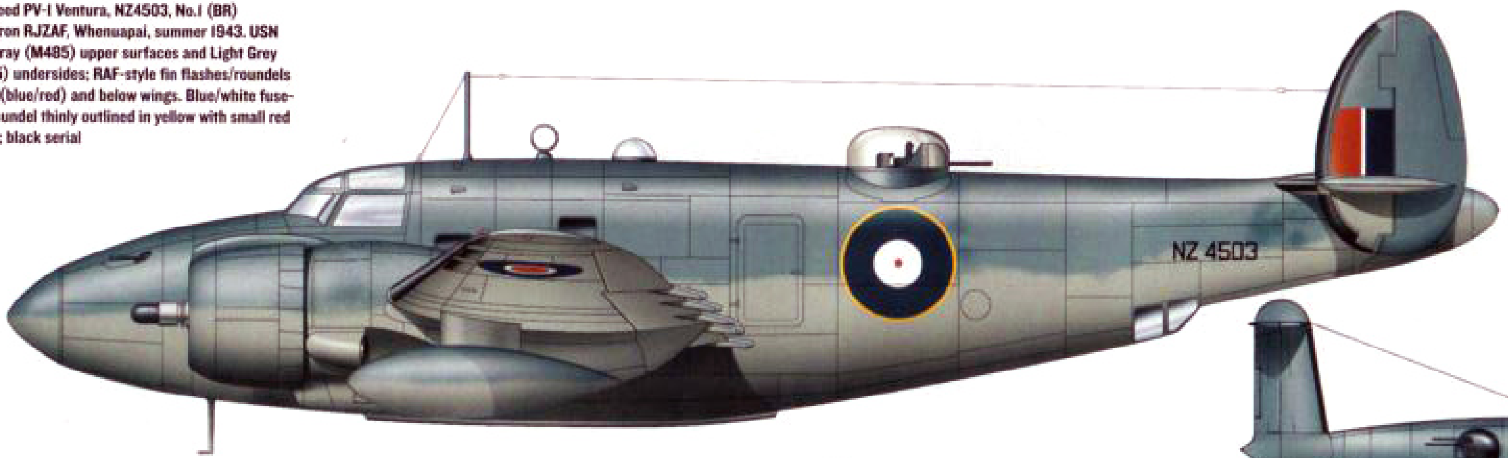
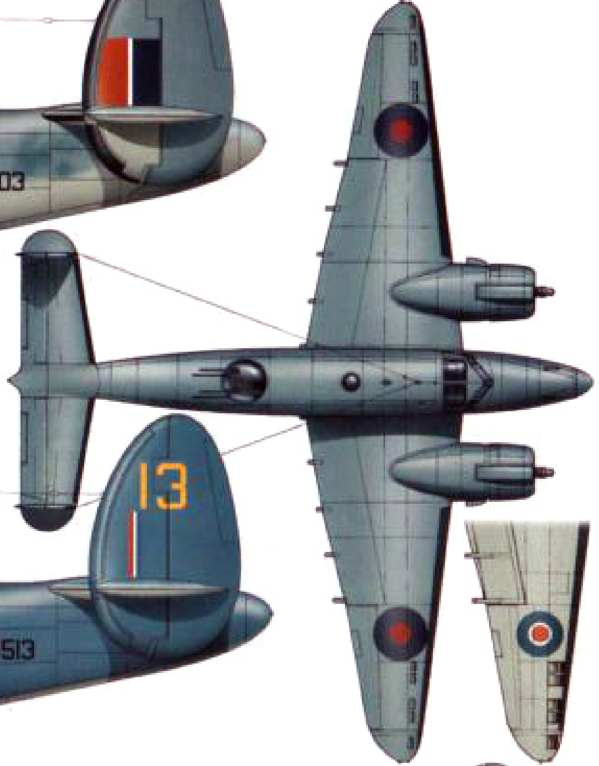
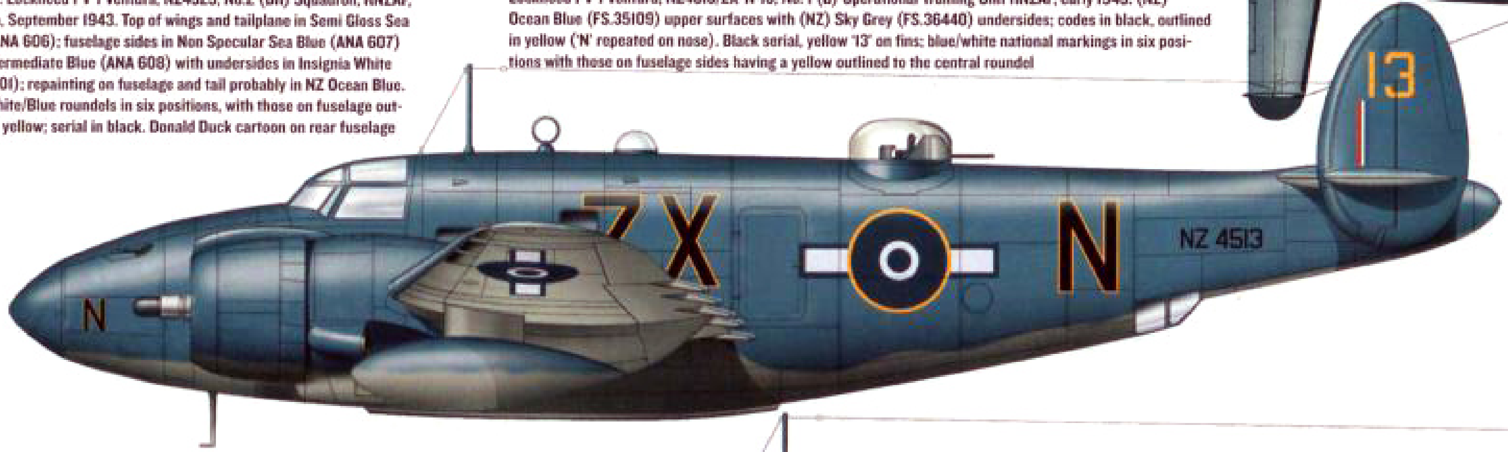
Lockheed PV-1 Ventura, NZ4503, No.1 (BR) Squadron RJZAF, Whenuapai, summer 1943. USN Blue Gray (M485) upper surfaces and Light Grey (M495) undersides; RAF-style fin flashes/roundels above (blue/red) and below wings. Blue/white fuselage roundel thinly outlined in yellow with small red centre; black serial

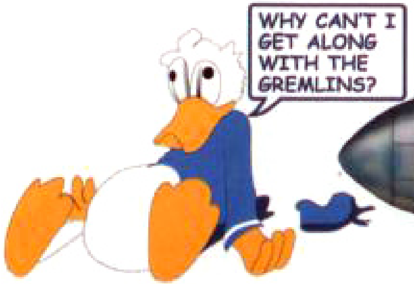


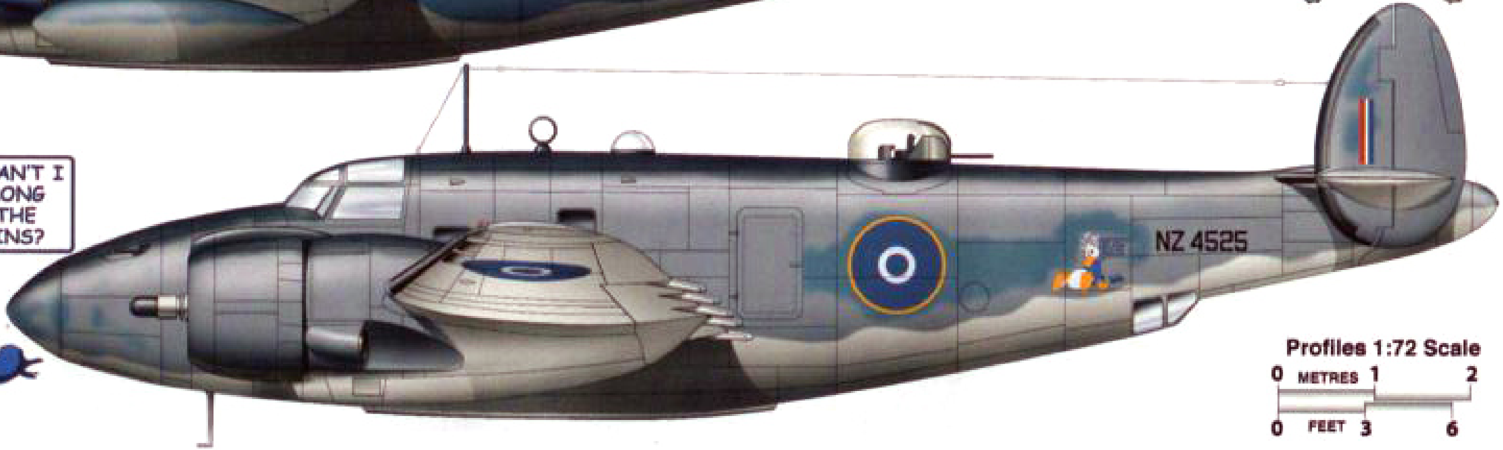


Bottom: Lockheed PV-1 Ventura, NZ4525, No.2 (BR) Squadron, RNZAF, Ohakea, September 1943. Top of wings and tailplane in Semi Gloss Sea Blue (ANA 606); fuselage sides in Non Specular Sea Blue (ANA 607) and Intermediate Blue (ANA 608) with undersides in Insignia White (ANA 601); repainting on fuselage and tail probably in NZ Ocean Blue. Blue/white/Blue roundels in six positions, with those on fuselage outlined in yellow; serial in black. Donald Duck cartoon on rear fuselage

Lockheed PV-1 Ventura, NZ4513/ZX•N-13, No. 1 (B) Operational Training Unit RNZAF, early 1945. (NZ) Ocean Blue (FS.35109) upper surfaces with (NZ) Sky Grey (FS.36440) undersides; codes in black, outlined in yellow ('N' repeated on nose). Black serial, yellow '13' on fins; blue/white national markings in six positions with those on fuselage sides having a yellow outlined to the central roundel







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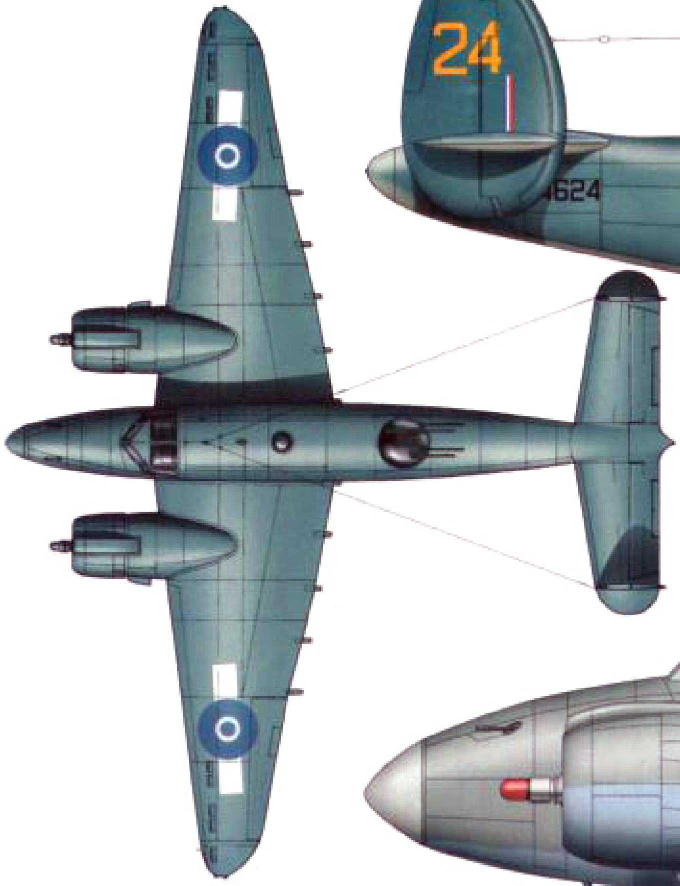
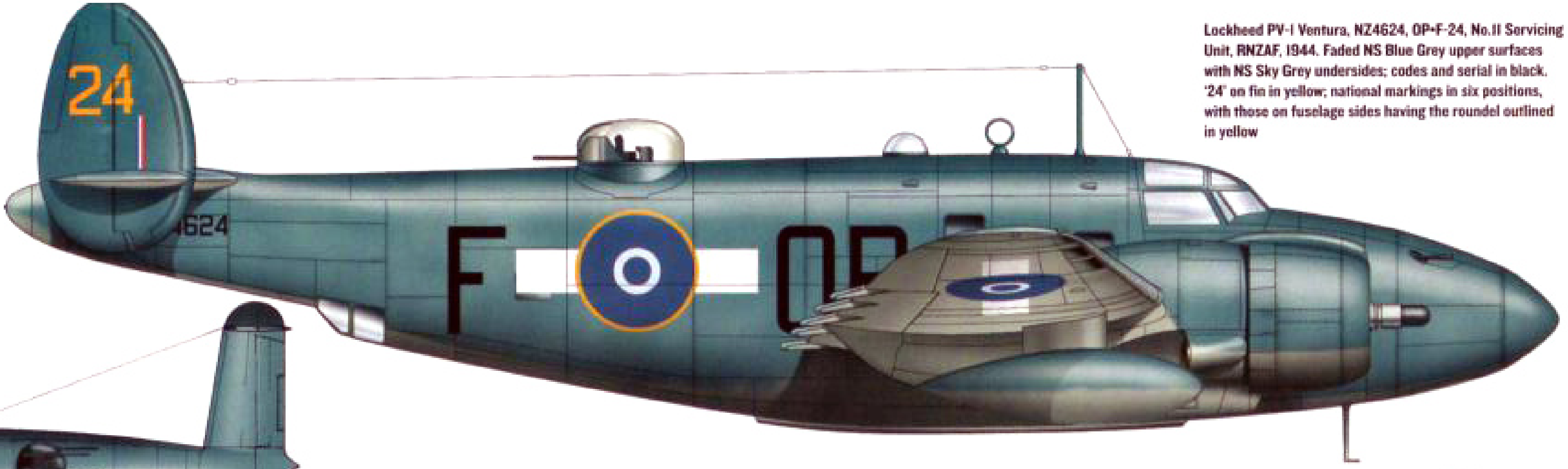
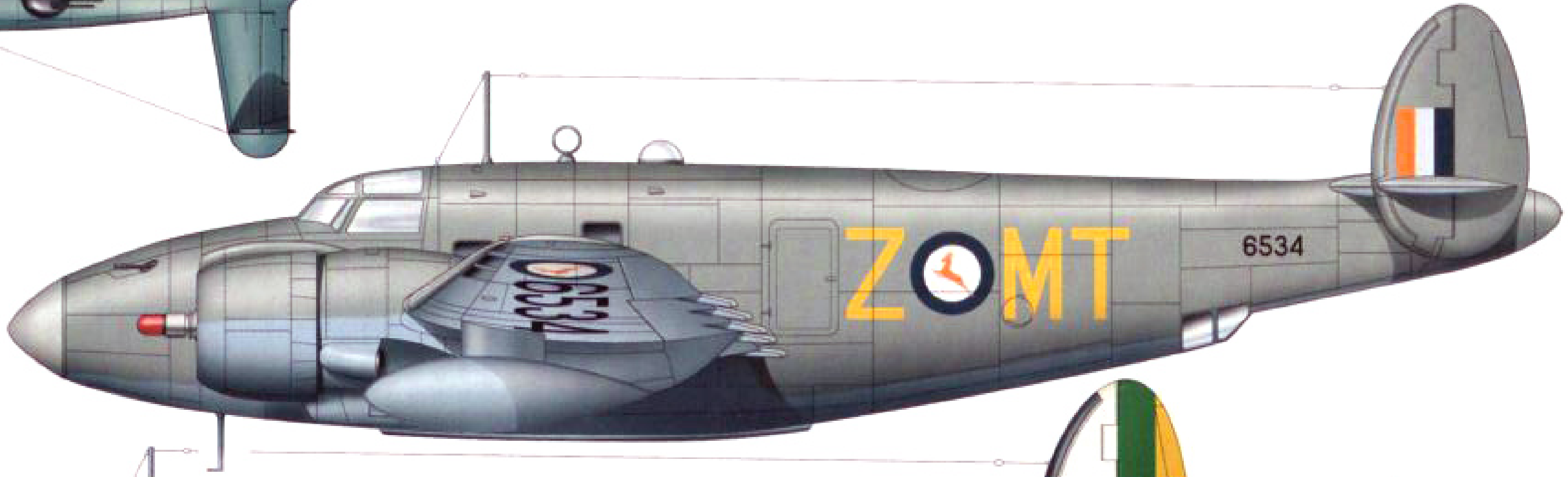
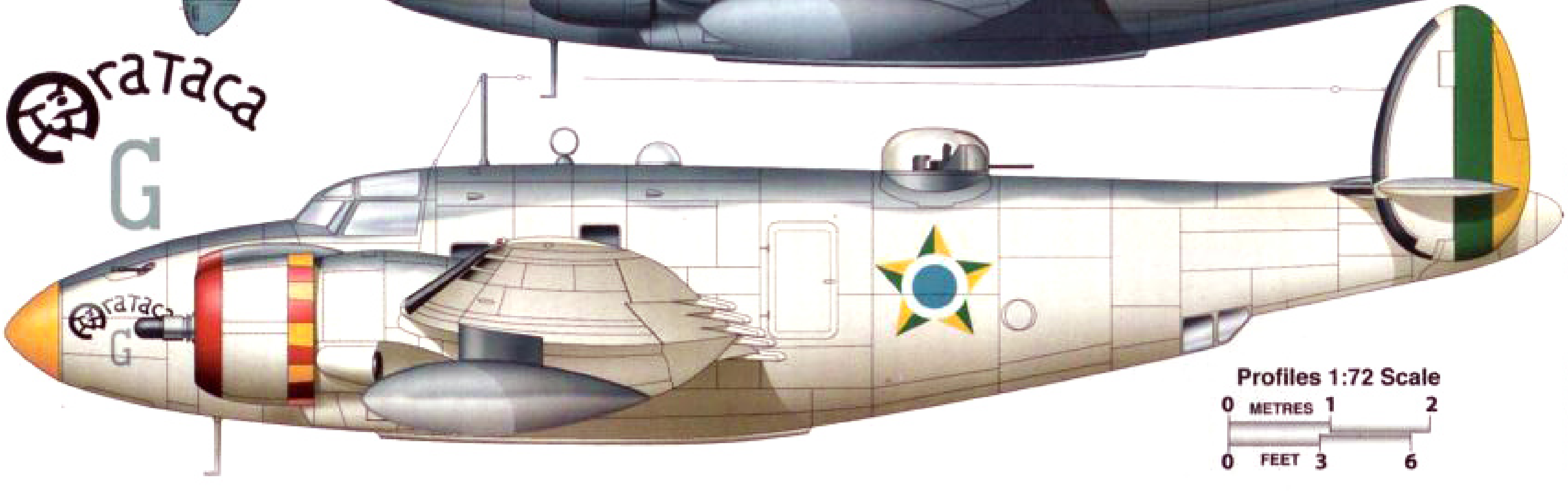




Lockheed PV-I Ventura, NZ4624, OP•F-24, No.II Servicing Unit, RNZAF, 1944. Faded NS Blue Grey upper surfaces with NS Sky Grey undersides; codes and serial in black. '24' on fin in yellow; national markings in six positions, with those on fuselage sides having the roundel outlined in yellow





Above: Lockheed Ventura GR Mk V, 6545, MT•Z, No.27 Squadron, SAAF. Medium grey upper surfaces with light blue undersides; codes in yellow, serials in black. National markings in six positions; fin flashes on both inside and outside surfaces. Red propeller hubs

Profiles 1:72 Scale

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Left: Lockheed PV-I Ventura, G/'Arataca', Io Grupo de Bombardeio Medio, Brazilian Air Force. White overall with Neutral Grey upper surfaces of wings and fuselage spine; yellow nose, red front of engine cowlings, red/yellow cowling cooling gills. 'G' on nose in Neutral Grey, name and nose art in black

That the Ventura was particularly disliked by its crews is an understatement, and by summer of 1943 the De Havilland Mosquito began to take over its front-line work. On 9 September 1943, No. 21 Squadron flew the last RAF bomber sortie and soon Venturas Mk.I were being modified for the reconnaissance role – the role for which it had originally been envisaged – under the designation of GR Mk.I for Coastal Command squadrons, which included Nos. 519 and 521 operating in the UK and Nos. 13 and 500 that operated in the Mediterranean.

COMMONWEALTH AIR FORCES AND THE VENTURA

Of the 200 Venturas Mk.IIA (FD568-767) only 25 examples were to see service with the RAF. This version was ordered under Lend-Lease and differed mainly in having US-manufactured armament, with 0.50in machine guns replacing the original 0.303in. A Martin dorsal turret housing a pair of 0.50in guns replaced the original Boulton-Paul turret. The balance from this order was either passed on to the RCAF or seized by the United States Army Air Force (USAAF) under the designation of B-34.

The Canadian Mk.IIAs were retained for training purposes, mainly serving with No. 340 Operational Training Unit (OTU) at Pennfield Ridge, New Brunswick and No. 1 Central Flying School at Trenton, Ontario. Little known is the fact that the B-34 was given the name of 'Lexington' in USAAF service, proof of the little impact that the aircraft left by the secondary duties to which it was assigned.

With the numbers on order already superfluous to its needs, Britain diverted large numbers of Venturas to Commonwealth air forces that were to operate the type around the globe. Canada and South Africa benefited from some 260 Mk.Is and IIs while additional purchases of over 350 PV-1s (under the US designation) were made for the RAAF, RNZAF, Royal Canadian Air Force (RCAF) and South African Air Force (SAAF).

The PV-1 was basically the same as the Ventura ordered by Britain except that it was fully equipped for the maritime reconnaissance role. Internal fuel capacity was increased from 1345 US gallons to 1607 gallons; two underwing tanks could carry an additional 155 gallons each while two tanks in the bomb-bay could be installed carrying a total of 490 gallons. Flexible nose guns were removed and the Perspex dome replaced by a solid nose. When not carrying fuel tanks, the bomb-bay could hold 3000lb of bombs, a torpedo or six 325lb depth charges. The PV-1's maiden flight took place on 3 November 1942 and 1600 examples of the type were built at the Vega plant.

The PV-1 was delivered to the RAF as the Ventura GR Mk.V, and considerable numbers were diverted to Commonwealth air forces. RAF units to be equipped with the Mk.V consisted of Nos. 519 and 521 Coastal Command Squadrons. Nos. 13 and 500 Squadrons operating in the Mediterranean also converted onto the GR Mk.V. No. 624 Squadron, born as No. 1575 Special Duties (SD) Flight, briefly operated a pair of Venturas Mk.V during 1943 from Maison Blanche in Algiers; most of this unit's operations were highly secret and little is known about its operations even up to this day.

By December 1942, No. 459 Squadron RAAF began operating Venturas, in conjunction with the Hudsons already on its inventory, from bases in Libya. The squadron flew maritime patrols and night bombing raids against targets in Greece and Crete until its ill-loved Venturas were replaced by Baltimores in July 1944. Nos. 4 and 11 Communications Units were equipped with Venturas Mk.IIA in May 1943 and continued to operate the type until the survivors were disposed of around 1947. No. 13 Squadron RAAF received Ventura GR Mk.Vs for service in New Guinea until the type was replaced by the Bristol Beaufort.

Apart from a small number of GR Mk.Vs from RAF contracts, the RCAF received 137 PV-1s, which along with the Mk.Vs saw service with Nos. 8, 113, 115, 145 and 148 Squadrons. No. 8 Squadron flew the type in Alaska between 1942 and 1943 and gave up the Ventura when the unit disbanded at Patricia Bay on 25 May 1945. No. 113 served mainly on the Atlantic Coast from April 1943 unit its disbandment in August of the following year. No. 115 flew Venturas up to August 1944 while another unit to serve in Alaska was No. 139 Squadron. After the war a number of Venturas were converted for target-towing while some were used as transport aircraft.

The first Venturas Mk.I and II were delivered to the SAAF at Ysterplaat (then known as Brooklyn Air Station) in 1942. The type would eventually equip Nos. 22, 23, 25, 27 and 29 Squadrons SAAF. Most units were assigned to protect Allied shipping around the Cape of Good Hope, while No. 22 Squadron moved to the Middle East in 1943 where it was later joined by No.17 Squadron. Both squadrons re-equipped with the Ventura GR Mk.V and operated from bases in Algeria, Sardinia and Gibraltar.

At the Director General SAAF Conference of 26 November 1946, it was decided that 62 Venturas Mk.IIA and 86 GR Mk.Vs then on inventory were to be retained. Nos. 21 and 60 Squadrons were equipped with the type and based at Zwartkop while No. 24 Squadron was based at Bloemspruit. Other SAAF units to fly the Ventura include the Bombing, Gunnery and Air Navigation School at Langebaanweg. Coast squadrons with the 'Pee-Vees', as the PV-1 was sometimes referred to, consisted of Nos. 17, 22 and 27. Operations with the Ventura within the SAAF ended when No. 24 Squadron was disbanded in 1951, although others continued to be operated by second line units, the last to be retired being the VIP transports in 1960.

An early version of the PV-1 for the US Navy, differing from early Ventura models by the installation of a Martin turret in place of the Boulton-Paul turret amidships (US Navy)

The RNZAF received 23 B-34s/ Ventura Mk.IIA (NZ4583-4605) originally intended as Hudson replacements with No. 4 (BR) Squadron at Nausori (Fiji). However the Hudson soldiered on alongside the new type well into 1944 when the unit completely converted onto the PV-1 version. Most of the older versions were passed on to No.1 Bomber OTU, while others were used for crew conversion training in forward areas. With the delivery of 116 PV-1s, Nos. 1, 2, 3, 4, 8 and 9 Squadrons RNZAF embarked on a long career on the type flying bombing, reconnaissance and air rescue missions in the Solomons. Initially found to be far more difficult to handle than the Hudson, 'Kiwi' crews eventually found the PV-1 suitable to their needs, and the type was even remembered with respect and affection by those who flew it. The Ventura remained in service until No. 2 Squadron relinquished its mounts in 1946.

Apart from Commonwealth units, the only other Venturas to serve outside the US were a small number delivered to the Free French in 1944 operated for a short period by Flotille 6F. Fourteen PV-1s served with the Brazilian Air Force during the post-war period, erroneously designated B-34 in that country.

WITH THE US NAVY

Lockheed Model 237-27-01, the PV-1 already described above, began life as a joint USN/USAAF project around mid-1942. At that time the USAAF was still responsible for anti-submarine patrols in the Atlantic and the Ventura was considered to be an ideal platform for such missions. On the other hand, the USN was looking for a long-range reconnaissance aircraft in order to take over such a role, one that it considered to be more in line with its own style of operations; in fact the Navy was already providing such a service using float-planes and flying-boats. Strong USAAF resistance to the use of land-based aircraft by the USN for such a purpose was eventually solved when the former offered to give up its anti-submarine patrols, allow the USN to acquire navalised versions of B-24s and B-25s, and of course the PV-1; in exchange the Navy would relinquish its Boeing PBB-1 Sea Ranger programme and hand over to the USAAF its aircraft manufacturing plant at Renton for B-29 production.

This meant that apart from the already mentioned Venturas surplus to RAF requirements, the USAAF was only to receive 27 Venturas Mk.IIA, which it operated under the designation of PV-3. By December 1942 the USN began to take deliveries of PV-1s and on 1 February of the following year the new aircraft entered service with VB-127 at Naval Air Station (NAS) Deland, Florida. Many were the East Coast squadrons that were to be formed in quick succession at this Station. Operating in the South Atlantic from Brazil, VB-127 was credited with the sinking of U-591 on 30 July 1943. A couple of months later the unit was transferred to Morocco to operate on the other side of the Atlantic, scoring another victory on 24 February 1944 with the sinking of U-761 off Gibraltar. Among the other units to operate successfully in the anti-submarine role with the VP-1 one finds VB-128, VB-129, VB-130, VB-133, VB-134, VB-141, VB-143, VB-145 and VB-149. Other 'bombing' squadrons were formed on the PV-1 for operations in the Pacific, and among these were VB-140, VB-142, VB-144 and VB-148

VP-135 was the first USN unit to receive PV-1s for operations in the Aleutians in April 1943. The type was soon to see wide use as more units flying the PV-1 were formed, including VP-131, VP-136 and VP-139. Apart from flying reconnaissance sorties, these units were also required to operate their aircraft in strikes against Japanese-held islands in that theatre. USN PV-1s were fitted with ASD-1 radar in the nose radome and therefore were useful acting as leaders for USAAF bombers. With the war in the Pacific reaching its height in the summer of 1944, PV-1 units were deployed to the Marianas in August from where VB-150 and VB-150 took over an airfield that had until recently been occupied by the Japanese.

Early in 1945 these two units were instrumental in clearing the sea from small Japanese picket boats used as spotting stations to provide early warnings of B-29 raids. By March 1945 VPB-133 had established a foothold on Iwo Jima while VPB-152 was operating from Peleiu by August. Among the latter unit's achievements one finds the location of survivors from USS Indianapolis nearly three days after it had been torpedoed and sunk during the night of 30 July 1945. Lt JG William C. Gwinn ordered his crew to drop the PV-1's life raft and life-jackets and remained on station until he was certain that a massive rescue operation had been launched. In the event 316 men from the 1,600-man crew of the Indianapolis had been saved. ■

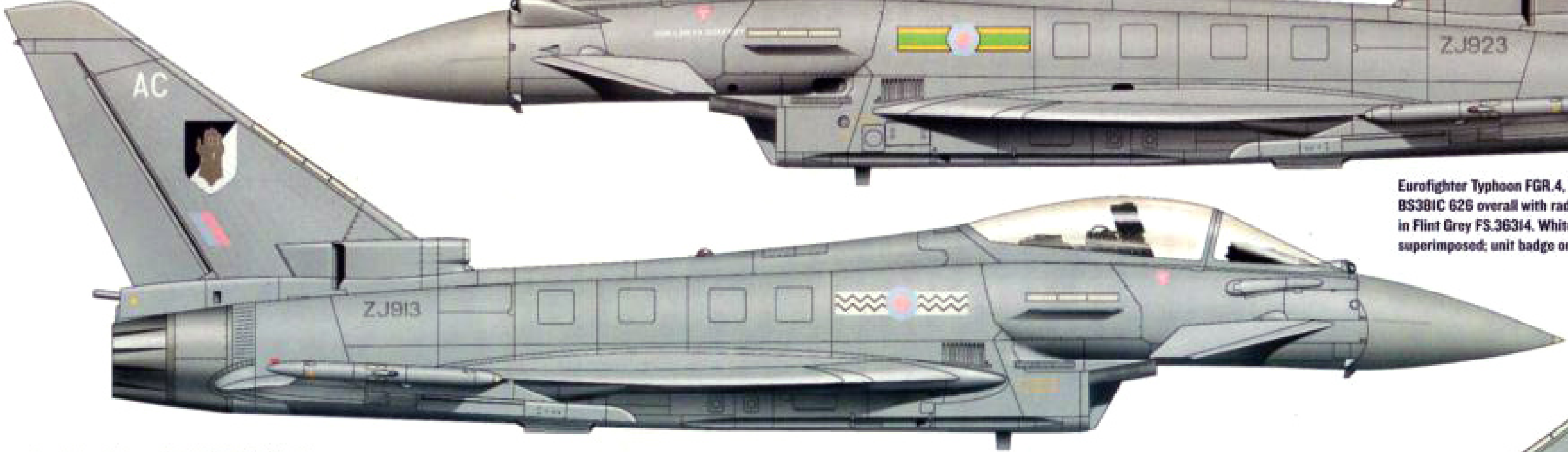
ROYAL AIR FORCE
Celebrating 90 Years

Model Airplane International
Original Artwork by Richard J. Caruana © MAI 2009

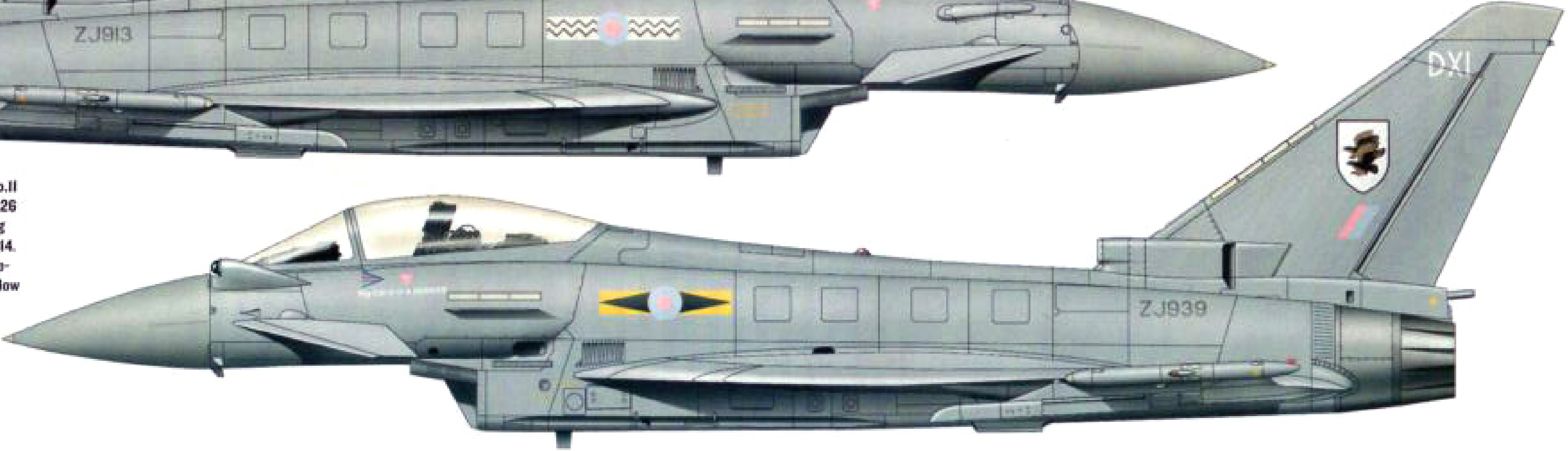
Eurofighter Typhoon FGR.4, ZJ910/BV, No.29 Squadron RAF. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. Red-outlined white bars flanking fuselage roundel with red 'XXX' superimposed; unit badge on fin. Note it retains the RAF 90th Anniversary logo below the fuselage markings from 2008 even though it returned to 29 Squadron from its FGR.4 upgrade on 17 September 2009. All RAF Typhoons carry the pale red/pale blue roundels above the port and below the starboard wings only

Eurofighter Typhoon FGR.4, XJ923/QO-E, No.3 Squadron RAF. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. Green/Yellow bands flanking fuselage roundels, outlined in black; unit badge on finr

Eurofighter Typhoon FGR.4, XJ913/AC, No.17 Squadron RAF. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. White bars flanking fuselage roundels with black zig-zag superimposed; unit badge on fin



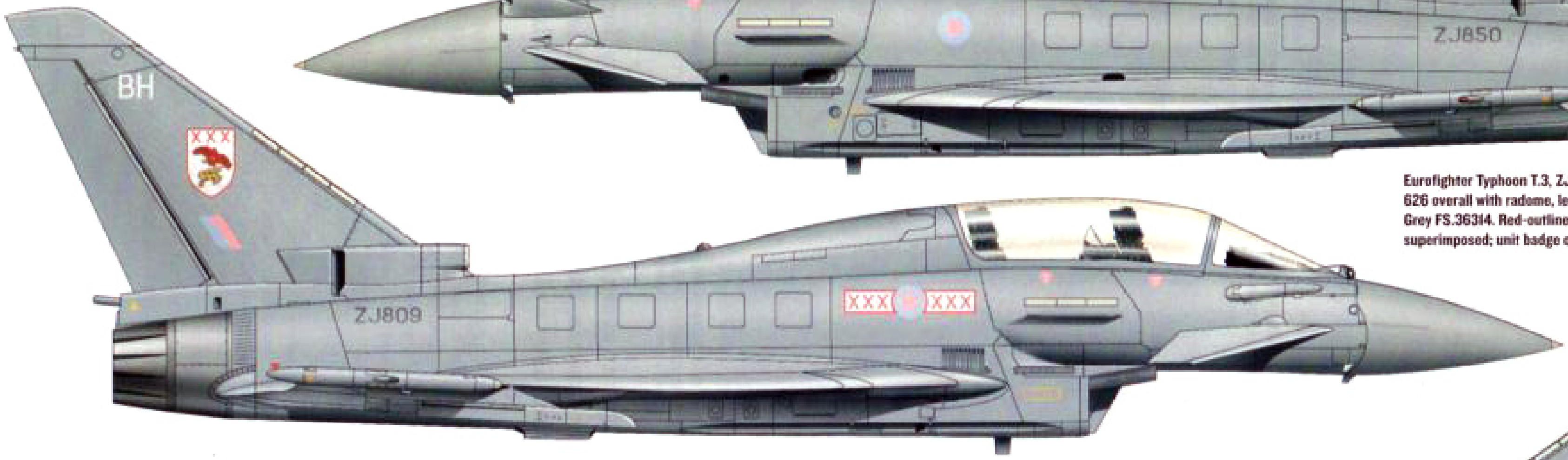
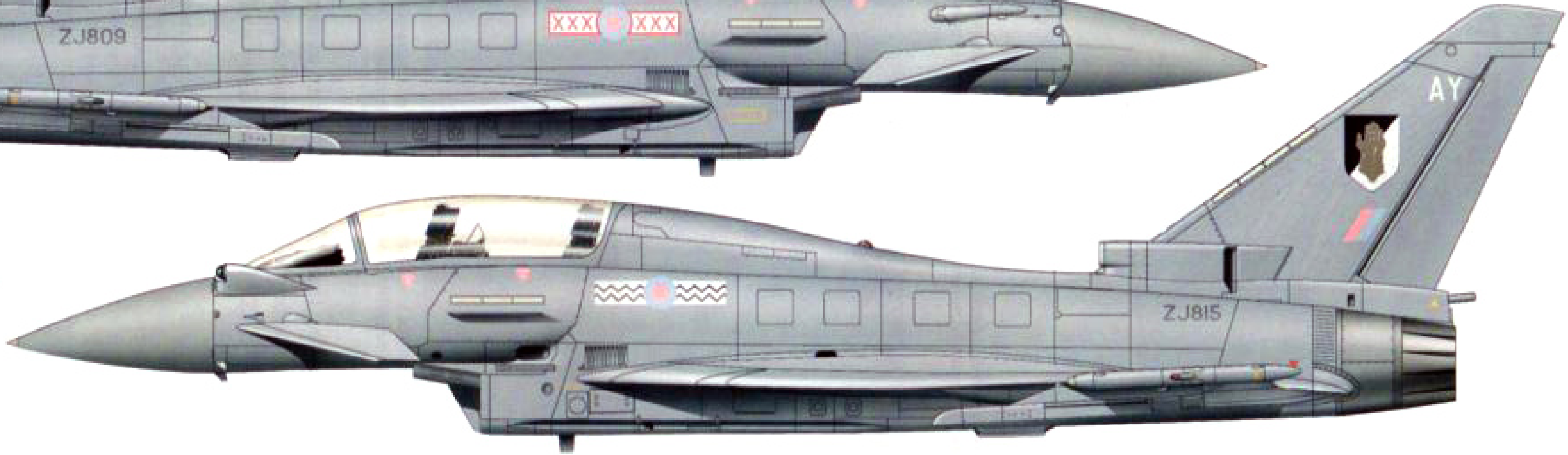
Eurofighter Typhoon FGR.4, ZJ939/DXI, No.11 Squadron RAF. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. Unit markings in yellow/black flanking fuselage roundels. Roundels above port and below starboard wings; unit badge on fin



Eurofighter Typhoon FGR.4, ZJ938, British Aerospace Systems, Warton. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. Red/white/blue flash on fin; BAe Warton crest on fin

Eurofighter Typhoon FGR.4, ZJ850, No.1435 Flight RAF, Falklands. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. 'Maltese' cross in red on white shield on fin

Eurofighter Typhoon T.3, ZJ809/BH, No.29 Squadron. Camouflage Grey BS381C 626 overall with radome, leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. Red-outlined white bars flanking fuselage roundel with red 'XXX' superimposed; unit badge on fin



Eurofighter Typhoon T.3, ZJ815/AY, No.17 Squadron RAF. Camouflage Grey BS381C 626 overall with FS.36280 radome; leading edges of flying surfaces and tip of fin in Flint Grey FS.36314. White bars with black zig-zag superimposed flanking fuselage roundels; unit badge on fin